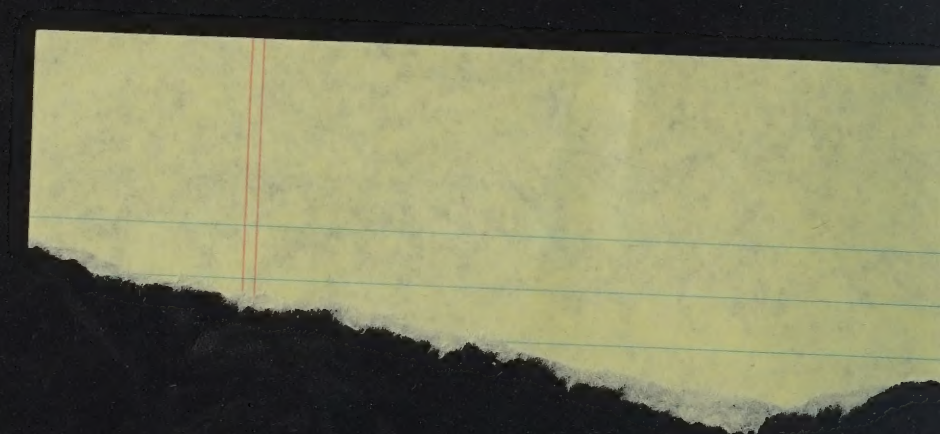


USE

93% Reduction



FT-747GX

TECHNICAL SUPPLEMENT

YAESU MUSEN CO., LTD.
C.P.O. BOX 1500
TOKYO, JAPAN

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FT-747GX TECHNICAL SUPPLEMENT



This manual is intended to serve as a supplement to the FT-747GX Operating Manual. Detailed information regarding functions, installation, interconnections and operation has been provided in the Operating Manual, and is not reprinted herein. Therefore, this supplement is not intended to serve as an independent reference, but to be used in conjunction with the information provided in the Operating Manual.

Because there are nearly two hundred and fifty semiconductor devices in the FT-747GX, circuit description information is provided in the form of numerous block diagrams. We hope that this manner of providing functional information proves to be more convenient for the owner and technician than would a lengthy verbal description. Those readers unfamiliar with the basic types of analog and digital circuits that serve as the building blocks of the FT-747GX are encouraged to study instructional material, such as that provided in handbooks on amateur radio and digital circuit design, before attempting to understand the design of the FT-747GX. Each block in the block diagrams represents one such basic circuit. General information on integrated circuits and their applications is available in the data provided by the IC manufacturers. Specific circuit details are provided in the schematic diagrams in this manual.

While we believe the technical information in this manual is correct, Yaesu assumes no liability for damage that may occur as a result of typographical or other errors that may be present. Your cooperation in pointing out any inconsistencies in the technical information would be appreciated.

Yaesu Musen reserves the right to make changes in the circuitry of this transceiver, in the interest of technological improvement, without obligation to notify owners or to modify any sets produced prior to the modification.

TOP COVER REMOVAL

The top cover of the FT-747GX must be removed as described here to install the modifications and internal options described afterwards.

- (1) Switch off the transceiver and disconnect all cables from the rear panel.
- (2) Referring to Figure 1 below, use a sharp instrument (such as a small screwdriver) to depress the catch pin in the strip on the side of the set (near the rear), while sliding the strip towards the rear with

your other hand. Do this on each side to remove both strips.

- (3) With the transceiver facing away from you, grasp the top panel with both hands near the front as shown in Figure 2. There are clips at positions (1) which can move only vertically, and a clip at (2) which can move only horizontally. Lift up on both sides to unlatch the clips at points (1) while holding the center clip (2) in the same position, and slide the top panel back about 2 centimeters ($\frac{1}{2}$ -inch) until the clips clear the top edge of the front panel.

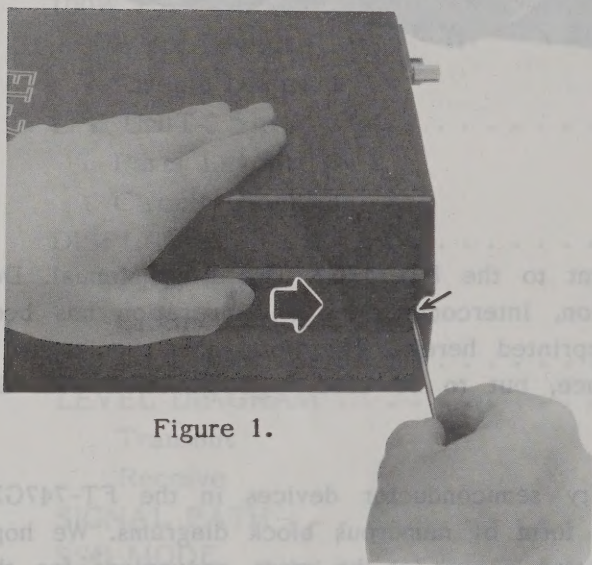


Figure 1.

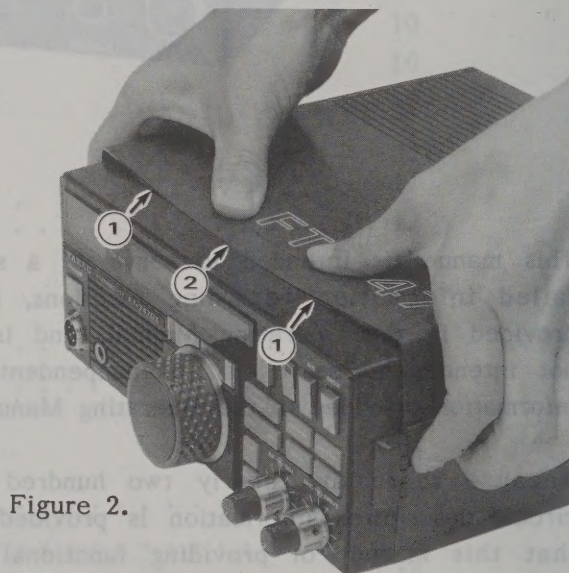
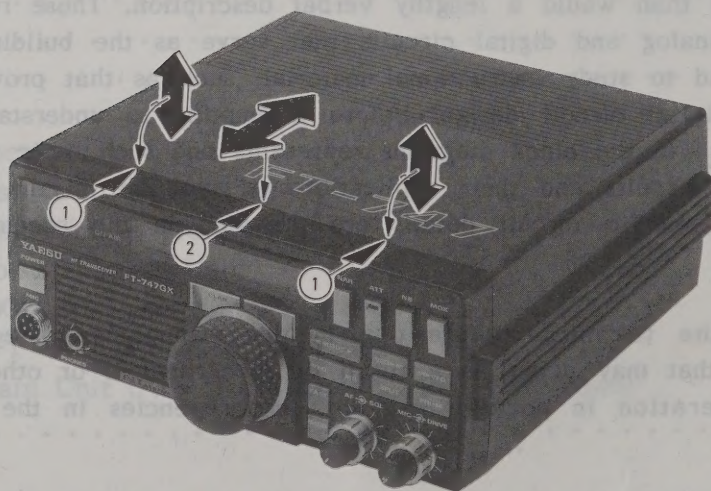


Figure 2.



PARTS LIST

	C029441AA	PCB with Components (SSB)	
	C029441AB	PCB with Components (SSB, CW, AM)	
D8201	G2090118	Diode	1SS97
D8202	G2090118	Diode	1SS97
D8203	G2090118	Diode	1SS97
D8204	G2090118	Diode	1SS97
D8205	G2060004	Diode	1SS270TJ
D8206	G2060004	Diode	1SS270TJ
D8207	G2090118	Diode	1SS97
D8208	G2060004	Diode	1SS270TJ
D8209	G2060004	Diode	1SS270TJ
D8210	G2090118	Diode	1SS97
D8211	G2090118	Diode	1SS97
D8212	G2090118	Diode	1SS97
D8213	G2060004	Diode	1SS270TJ
D8214	G2060004	Diode	1SS270TJ
D8215	G2090408	Diode *, ***	1SS270TJ
D8216	G2090408	Diode *, **	1SS270TJ
D8217	G2090118	Diode	1SS97
XF8201	H1102128	XTAL Filter	XF8.2M-242-02
XF8202	H1102129	XTAL Filter **	XF8.2M-501-01
XF8203	H1102130	XTAL Filter ***	XF8.2M-602-01
R8201	J01225471	Carbon Film RES.	1/6W 470 ohm PJ
R8202	J01225221	Carbon Film RES.	1/6W 220 ohm PJ
R8203	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
R8204	J01225470	Carbon Film RES.	1/6W 47 ohm PJ
R8205	J01225151	Carbon Film RES.	1/6W 150 ohm PJ
R8206	J01225221	Carbon Film RES.	1/6W 220 ohm PJ
R8207	J01225391	Carbon Film RES.	1/6W 390 ohm PJ
R8208	J01225121	Carbon Film RES.	1/6W 120 ohm PJ
R8209	J01225102	Carbon Film RES.	1/6W 1k ohm PJ
R8210	J01225121	Carbon Film RES.	1/6W 120 ohm PJ
R8211	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
R8212	J01225471	Carbon Film RES.	1/6W 470 ohm PJ
R8213	J01225010	Carbon Film RES.	1/6W 1 ohm PJ
R8214	J01225010	Carbon Film RES.	1/6W 1 ohm PJ
R8215	J01225271	Carbon Film RES.	1/6W 270 ohm PJ
C8201	K00173100	Ceramic CAP.	SL 50V 10pF
C8202	K28129001	Ceramic CAP.	Y 16V 0.01uF
C8203	K28129001	Ceramic CAP.	Y 16V 0.01uF
C8204	K00173100	Ceramic CAP.	SL 50V 10pF
C8205	K28129001	Ceramic CAP.	Y 16V 0.01uF
C8206	K28129001	Ceramic CAP.	Y 16V 0.01uF
C8208	K28129001	Ceramic CAP.	Y 16V 0.01uF
C8209	K28129001	Ceramic CAP.	Y 16V 0.01uF
C8211	K28129001	Ceramic CAP.	Y 16V 0.01uF
L8201	L1190220	M. RFC	150uH
L8202	L1190220	M. RFC	150uH
L8203	L1190220	M. RFC	150uH
J8201	P0090352	Connector	
J8202	P0090390	Connector	
PHONE-JACK UNIT			
Symbol No.	Part No.	Description	Device
	F2943103A	Printed Circuit Board	
	C029433AA	PCB with Components	
J9001	P1090351	Connector	
	T9205616	CW-ASSY	
ACCESSORIES			
Symbol No.	Part No.	Description	Device
	T9014900	DC-Code	
	Q0000012	FUSE •	6A
	Q0000009	FUSE ▲	20A

*: SSB Filter
 **: CW Filter
 ***: AM Filter

• 10W Type
 ▲ 100W Type

PARTS LIST

T6001	L0020788A	Coil				C5002	K10179024	Ceramic CAP.	B	50V	0.01uF
T6002	L0021607	Coil				C5003	K10179024	Ceramic CAP.	B	50V	0.01uF
T6003	L0020834A	Coil				C5004	K13179009	Ceramic CAP.	F	50V	0.047uF
RL6001	M1190054	Relay	AR4211 (DC12V)			C5005	K13179008	Ceramic CAP.	F	50V	0.01uF
J6001	P1090255	Connector				C5006	K40129004	AL. Electro. CAP.		16V	10uF
J6002	P1090255	Connector				C5007	K13179009	Ceramic CAP.	F	50V	0.047uF
J6003	P0090622	Connector				C5009	K13179008	Ceramic CAP.	F	50V	0.01uF
J6004	P0090621	Connector				C5010	K00175471	Ceramic CAP.	SL	50V	470uF
J6005	P0100970	Terminal				C5011	K13179009	Ceramic CAP.	F	50V	0.047uF
J6006	P0100970	Terminal				C5012	K13179009	Ceramic CAP.	F	50V	0.047uF
	R0103760	TR Heatsink				C5013	K19149025	Ceramic CAP.		25V	0.1uF
	R0102810	NUT Board				C5014	K19149021	Ceramic CAP.		25V	0.047uF
	Q9000192	Sarcon				C5015	K13179009	Ceramic CAP.	F	50V	0.047uF
100W-PA UNIT						C5016	K30279093	Mica CAP.		500V	1000pF
Symbol No.	Part No.	Description	Device			C5017	K10276682	Ceramic CAP.	B	500V	6800pF
	F2947000	Printed Circuit Board				C5018	K10276682	Ceramic CAP.	B	500V	6800pF
	C029470AA	PCB with Components				C5019	K13179009	Ceramic CAP.	F	50V	0.047uF
Q5001	G3321660	Transistor	2SC2166			C5020	K50177683	Film CAP.		50V	0.068uF
Q5002	G3090086	Transistor	2SC3133-21			C5021	K13179009	Ceramic CAP.	F	50V	0.047uF
Q5003	G3090086	Transistor	2SC3133-21			C5022	K50177683	Film CAP.		50V	0.068uF
Q5004	G3090087	Transistor	2SC3240-21			C5023	K30279090	Mica CAP.		500V	560pF
Q5005	G3090087	Transistor	2SC3240-21			C5024	K30279090	Mica CAP.		500V	560pF
Q5006	G1090294	IC	uPC7808H			C5025	K30279092	Mica CAP.		500V	750pF
Q5007	G3408820Q	Transistor	2SD882Q			C5026	K30279091	Mica CAP.		500V	620pF
Q5008	G3208240R	Transistor	2SB824R			C5027	K13179009	Ceramic CAP.	F	50V	0.047uF
Q5009	G3304580D	Transistor	2SC458D			C5028	K40129004	AL. Electro. CAP.		16V	10uF
Q5010	G1090649	IC	M5218L			C5029	K13179009	Ceramic CAP.	F	50V	0.047uF
Q5011	G3320010L	Transistor	2SC2001-L			C5030	K40129004	AL. Electro. CAP.		16V	10uF
TH5001	G9090011	Thermistor	SDT1000			C5031	K13179009	Ceramic CAP.	F	50V	0.047uF
D5001	G2090217	Diode	HZ3C1			C5032	K40129004	AL. Electro. CAP.		16V	10uF
D5002	G2090306	Diode	10E1			C5033	K40129021	AL. Electro. CAP.		16V	1000uF
D5003	G2090306	Diode	10E1			C5034	K19149025	Ceramic CAP.		25V	0.1uF
D5004	G2090306	Diode	10E1			C5035	K40129004	AL. Electro. CAP.		16V	10uF
D5005	G2090306	Diode	10E1			C5036	K13179009	Ceramic CAP.	F	50V	0.047uF
D5006	G2015550	Diode	1S1555			C5037	K13179009	Ceramic CAP.	F	50V	0.047uF
D5007	G2015550	Diode	1S1555			C5038	K40129004	AL. Electro. CAP.		16V	10uF
R5001	J02225470	Carbon Film RES.	1/6W 47 ohm	UJ		C5039	K40129013	AL. Electro. CAP.		16V	1uF
R5002	J02225331	Carbon Film RES.	1/6W 330 ohm	UJ		C5040	K40129013	AL. Electro. CAP.		16V	1uF
R5003	J02225331	Carbon Film RES.	1/6W 330 ohm	UJ		C5041	K13179009	Ceramic CAP.	F	50V	0.047uF
R5004	J02225121	Carbon Film RES.	1/6W 120 ohm	UJ		C5042	K13179009	Ceramic CAP.	F	50V	0.047uF
R5005	J02245279	Carbon Film RES.	1/4W 2.7 ohm	UJ		C5043	K13179009	Ceramic CAP.	F	50V	0.047uF
R5006	J01275470	Carbon Film RES.	1/2W 47 ohm	PJ		C5044	K13179008	Ceramic CAP.	F	50V	0.01uF
R5007	J01275240	Carbon Film RES.	1/2W 24 ohm	PJ		C5045	K13179008	Ceramic CAP.	F	50V	0.01uF
R5008	J01275240	Carbon Film RES.	1/2W 24 ohm	PJ		C5046	K13179008	Ceramic CAP.	F	50V	0.01uF
R5009	J20306820	Metal Film RES.	1W 82 ohm			C5047	K13179008	Ceramic CAP.	F	50V	0.01uF
R5010	J20306820	Metal Film RES.	1W 82 ohm			C5048	K30275361	Mica CAP.		500V	360pF
R5011	J20306339	Metal Film RES.	1W 3.3 ohm			L5001	L1190196	M. RFC			1.2uH
R5012	J20306339	Metal Film RES.	1W 3.3 ohm			L5002	L1020015	RFC			
R5013	J20306339	Metal Film RES.	1W 3.3 ohm			L5003	L1020015	RFC			
R5014	J20306339	Metal Film RES.	1W 3.3 ohm			L5004	L0021432	Coil			41.0uH
R5015	J01275180	Carbon Film RES.	1/2W 18 ohm	PJ		T5001	L0020788A	Coil			
R5016	J01275180	Carbon Film RES.	1/2W 18 ohm	PJ		T5002	L0020833A	Coil			
R5017	J22359001	Metal Film RES.	3W 39 ohm			T5003	L0021854	Coil			
R5018	J22359001	Metal Film RES.	3W 39 ohm			T5004	L0020404	Coil			
R5019	J21339003	Metal Film RES.	2W 39 ohm			RL5001	M1190055	Relay	AR49032 (DC12V)		
R5020	J01275180	Carbon Film RES.	1/2W 18 ohm	PJ		J5001	P1090255	Connector			
R5021	J01275221	Carbon Film RES.	1/6W 220 ohm	UJ		J5002	P1090255	Connector			
R5022	J02225102	Carbon Film RES.	1/6W 1k ohm	UJ		J5003	P0090622	Connector			
R5023	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ		J5004	P0090621	Connector			
R5024	J02225223	Carbon Film RES.	1/6W 22k ohm	UJ		J5005	R0100970	Terminal			
R5025	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ		J5006	R0100970	Terminal			
R5026	J02225223	Carbon Film RES.	1/6W 22k ohm	UJ		J5007	P0090621	Connector			
R5027	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ			R0103760	TR Heatsink			
R5028	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ			Q9000192	Sarcon			
R5029	J02225272	Carbon Film RES.	1/6W 2.7k ohm	UJ			Q9000284	Insulator			
R5030	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ							
R5031	J02225474	Carbon Film RES.	1/6W 470k ohm	UJ							
R5032	J02225472	Carbon Film RES.	1/6W 4.7k ohm	UJ							
R5033	J02225102	Carbon Film RES.	1/6W 1k ohm	UJ							
R5034	J20306569	Metal Film RES.	1W 5.6 ohm								
VR5001	J51745331	POT.	B 33 ohm			FILTER UNIT					
Symbol No.	Part No.	Description	Device			C2944101	Printed Circuit Board				
C5001	K10179024	Ceramic CAP.	B 50V 0.01uF								

PARTS LIST

C4003	K00276161	Ceramic CAP.	SL	500V	160pF				
C4004	K30275122	Mica CAP.		500V	1200pF		T9205614A	Wire ASSY	JP4001 (P4001)
C4005	K30275681	Mica CAP.		500V	680pF				
C4006	K30275561	Mica CAP.		500V	560pF				
C4007	K30275821	Mica CAP.		500V	820pF				
C4008	K00275180	Ceramic CAP.	SL	500V	18pF				
C4009	K30275561	Mica CAP.		500V	560pF				
C4010	K00275241	Ceramic CAP.	SL	500V	240pF				
C4011	K30275122	Mira CAP.		500V	1200pF				
C4012	K00275820	Ceramic CAP.	SL	500V	82pF				
C4013	K30275621	Mira CAP.		500V	620pF				
C4014	K00275241	Ceramic CAP.	SL	500V	240pF				
C4015	K00275111	Ceramic CAP.	SL	500V	110pF				
C4016	K30275681	Mira CAP.		500V	680pF				
C4017	K00275360	Ceramic CAP.	SL	500V	36pF				
C4018	K00275151	Ceramic CAP.	SL	500V	150pF				
C4019	K00275221	Ceramic CAP.	SL	500V	220pF				
C4020	K00276161	Ceramic CAP.	SL	500V	160pF				
C4021	K00275430	Ceramic CAP.	SL	500V	43pF				
C4022	K30275301	Mira CAP.		500V	300pF				
C4023	K00275111	Ceramic CAP.	SL	500V	110pF				
C4024	K00275111	Ceramic CAP.	SL	500V	110pF				
C4025	K00275101	Ceramic CAP.	SL	500V	100pF				
C4026	K00275430	Ceramic CAP.	SL	500V	43pF				
C4027	K00275151	Ceramic CAP.	SL	500V	150pF				
C4028	K00275820	Ceramic CAP.	SL	500V	82pF				
C4029	K00275120	Ceramic CAP.	SL	500V	12pF				
C4030	K00275111	Ceramic CAP.	SL	500V	110pF				
C4031	K00275820	Ceramic CAP.	SL	500V	82pF				
C4032	K00275330	Ceramic CAP.	SL	500V	33pF				
C4033	K00276161	Ceramic CAP.	SL	500V	160pF				
C4034	K00275120	Ceramic CAP.	SL	500V	12pF				
C4035	K00275910	Ceramic CAP.	SL	500V	91pF				
C4036	K00175221	Ceramic CAP.	SL	50V	220pF				
C4037	K00175221	Ceramic CAP.	SL	50V	220pF				
C4038	K00275100	Ceramic CAP.	SL	500V	10pF				
C4039	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4040	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4041	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4042	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4043	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4044	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4045	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4046	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4047	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4048	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4049	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4050	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4051	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4052	K13179009	Ceramic CAP.	F	50V	0.047uF				
C4053	K13179009	Ceramic CAP.	F	50V	0.047uF				
TC4001	K91000013	Variable CAP.			20pF				
L4001	L0021405	Coil			3.77uH				
L4002	L0021406	Coil			2.94uH				
L4003	L0020615	Coil			1.90uH				
L4004	L0021433	Coil			2.40uH				
L4005	L0020617	Coil			1.10uH				
L4006	L0020618	Coil			1.32uH				
L4007	L0021407	Coil			0.62uH				
L4008	L0021408	Coil			0.46uH				
L4009	L0021855	Coil							
L4010	L0021856	Coil							
L4011	L0021857	Coil							
L4012	L0021858	Coil							
L4013	L0021859	Coil							
L4014	L1190090	M. RFC			1mH				
L4015	L1190090	M. RFC			1mH				
RL4001	M1190045	Relay	AG2013 (DC12V)						
RL4002	M1190045	Relay	AG2013 (DC12V)						
RL4003	M1190045	Relay	AG2013 (DC12V)						
RL4004	M1190045	Relay	AG2013 (DC12V)						
RL4005	M1190045	Relay	AG2013 (DC12V)						
RL4006	M1190045	Relay	AG2013 (DC12V)						
RL4007	M1190045	Relay	AG2013 (DC12V)						
RL4008	M1190045	Relay	AG2013 (DC12V)						
RL4009	M1190045	Relay	AG2013 (DC12V)						
RL4010	M1190045	Relay	AG2013 (DC12V)						
RL4011	M1190045	Relay	AG2013 (DC12V)						
RL4012	M1190045	Relay	AG2013 (DC12V)						
RL4013	M1190078	Relay	AG2017 (DC9V)						
	T9317815	Wire ASSY	P4002						
	T9205615	Wire ASSY	P4003						
	T9317816	Wire ASSY	P4004						
10W-PA UNIT									
Symbol No.	Part No.	Description	Device						
	F2946000	Printed Circuit Board							
	C029460AA	PCB with Components							
Q6001	G3321660	Transistor	2SC2166						
Q6002	G3090086	Transistor	2SC3133						
Q6003	G3090086	Transistor	2SC3133						
Q6004	G1090080	IC	uPC78L08						
Q6005	G3408820Q	Transistor	2SD882Q						
Q6006	G3208240R	Transistor	2SB824R						
Q6007	G3090079	Transistor	BA1A4P						
D6001	G2090217	Diode	HZ3C1						
D6002	G2015880	Diode	1S1588						
D6003	G2090306	Diode	10E1						
D6004	G2015550	Diode	1S1555						
D6005	G2015550	Diode	1S1555						
R6001	J02225221	Carbon Film RES.	1/6W 220 ohm	UJ					
R6002	J02225471	Carbon Film RES.	1/6W 470 ohm	UJ					
R6003	J02225681	Carbon Film RES.	1/6W 680 ohm	UJ					
R6004	J01225821	Carbon Film RES.	1/6W 820 ohm	PJ					
R6005	J02225181	Carbon Film RES.	1/6W 180 ohm	UJ					
R6006	J01275150	Carbon Film RES.	1/2W 15 ohm	TJ					
R6007	J01275150	Carbon Film RES.	1/2W 15 ohm	TJ					
R6008	J01275331	Carbon Film RES.	1/2W 330 ohm	TJ					
R6009	J01275331	Carbon Film RES.	1/2W 330 ohm	TJ					
R6010	J01275390	Carbon Film RES.	1/2W 39 ohm	TJ					
R6012	J02225102	Carbon Film RES.	1/6W 1k ohm	UJ					
R6013	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ					
R6014	J02225331	Carbon Film RES.	1/6W 330 ohm	UJ					
R6015	J20336680	Metal Film RES.	1/6W 68 ohm						
VR6001	J51727222	POT.	B 2.2k ohm						
C6001	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6002	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6003	K00175221	Ceramic CAP.	SL 50V 200pF						
C6004	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6005	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6006	K40129004	AL. Electro. CAP.	16V 10uF						
C6007	K00275121	Ceramic CAP.	SL 500V 120pF						
C6008	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6009	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6010	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6011	K00275151	Ceramic CAP.	SL 500V 150pF						
C6012	K00275151	Ceramic CAP.	SL 500V 150pF						
C6013	K00275151	Ceramic CAP.	SL 500V 150pF						
C6014	K10179024	Ceramic CAP.	B 50V 0.01uF						
C6015	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6016	K50177154	Film CAP.	50V 0.15uF						
C6017	K50177154	Film CAP.	50V 0.15uF						
C6018	K13179008	Ceramic CAP.	F 50V 0.01uF						
C6019	K13179008	Ceramic CAP.	F 50V 0.01uF						
C6020	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6021	K40129004	AL. Electro. CAP.	16V 10uF						
C6022	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6023	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6024	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6025	K13179008	Ceramic CAP.	F 50V 0.01uF						
C6026	K40129008	AL. Electro. CAP.	16V 33uF						
C6027	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6028	K40129021	AL. Electro. CAP.	16V 1000uF						
C6029	K13179009	Ceramic CAP.	F 50V 0.047uF						
C6030	K13179008	Ceramic CAP.	F 50V 0.01uF						
C6031	K13179008	Ceramic CAP.	F 50V 0.01uF						
C6032	K00275360	Ceramic CAP.	SL 500V 36pF						
L6001	L1190149	M. RFC	1uH						
L6002	L1190213	M. RFC	39uH						
L6003	L1020032	RFC	9.9uH						
L6004	L1020015	RFC							
L6005	L1020032	RFC	9.9uH						
L6006	L1020666A	RFC							

PARTS LIST

D3007	G2060004	Diode	1SS270TJ						
D3008	G2090118	Diode	1SS97						
D3009	G2090118	Diode	1SS97						
D3010	G2090415	Diode	GL8PG25						
D3011	G2060004	Diode	1SS270TJ						
D3012	G2060004	Diode	1SS270TJ						
D3013	G2060004	Diode	1SS270TJ						
DS3001	G6090066	LCD	FTD8627PZ						
CO3001	H3900170	Ceramic Filter	CSA400MG5						
R3001	J01225391	Carbon Film RES.	1/6W 390 ohm	PJ					
R3004	J01225105	Carbon Film RES.	1/6W 1M ohm	PJ					
R3006	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ					
R3007	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ					
R3008	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3009	J01225102	Carbon Film RES.	1/6W 1k ohm	PJ					
R3010	J01225104	Carbon Film RES.	1/6W 100k ohm	PJ					
R3011	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ					
R3012	J01225472	Carbon Film RES.	1/6W 4.7k ohm	PJ					
R3014	J01225104	Carbon Film RES.	1/6W 100k ohm	PJ					
R3015	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3017	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3018	J01225472	Carbon Film RES.	1/6W 4.7k ohm	PJ					
R3019	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ					
R3020	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ					
R3021	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3022	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ					
R3023	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ					
R3024	J01225470	Carbon Film RES.	1/6W 47 ohm	PJ					
R3025	J01225010	Carbon Film RES.	1/6W 1 ohm	PJ					
R3026	J01225229	Carbon Film RES.	1/6W 2.2 ohm	PJ					
R3027	J01225221	Carbon Film RES.	1/6W 220 ohm	PJ					
R3028	J01225104	Carbon Film RES.	1/6W 100k ohm	PJ					
R3029	J01225221	Carbon Film RES.	1/6W 220 ohm	PJ					
R3030	J01225272	Carbon Film RES.	1/6W 2.7k ohm	PJ					
R3031	J01225681	Carbon Film RES.	1/6W 680 ohm	PJ					
R3032	J01225122	Carbon Film RES.	1/6W 1.2k ohm	PJ					
R3033	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3034	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3035	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3036	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3037	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3038	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3039	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3040	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3041	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3042	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3043	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3044	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ					
R3045	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ					
R3046	J01225560	Carbon Film RES.	1/6W 56 ohm	PJ					
R3047	J01225560	Carbon Film RES.	1/6W 56 ohm	PJ					
RB3001	J40900030	Block RES.	8P 47k ohm						
C3001	K28129001	Ceramic CAP.	Y 16V 0.01uF						
C3002	K40129012	AL. Electro. CAP.	16V 10uF						
C3003	K28129001	Ceramic CAP.	Y 16V 0.01uF						
C3004	K40129012	AL. Electro. CAP.	16V 10uF						
C3005	K40179003	AL. Electro. CAP.	50V 0.22uF						
C3006	K28129001	Ceramic CAP.	Y 16V 0.01uF						
C3007	K28129001	Ceramic CAP.	Y 16V 0.01uF						
C3008	K28129001	Ceramic CAP.	Y 16V 0.01uF						
C3009	K28129001	Ceramic CAP.	Y 16V 0.01uF						
C3010	K28129001	Ceramic CAP.	Y 16V 0.01uF						
C3011	K00175150	Ceramic CAP.	SL 50V 15p						
C3012	K00175150	Ceramic CAP.	SL 50V 15p						
C3013	K40179005	AL. Electro. CAP.	50V 0.47uF						
C3014	K28129001	Ceramic CAP.	Y 16V 0.01uF						
C3015	K19149025	Ceramic CAP.	25V 0.1uF						
C3016	K40129028	AL. Electro. CAP.	16V 47uF						
C3017	K40129038	AL. Electro. CAP.	16V 100uF						
C3018	K19149025	Ceramic CAP.	16V 0.1uF						
C3019	K40129049	AL. Electro. CAP.	16V 470uF						
C3020	K50177104	Film CAP.	50V 0.1uF						
C3021	K40089009	AL. Electro. CAP.	6.3V 470uF						
C3022	K28129001	Ceramic CAP.	Y 16V 0.01uF						
C3023	K40129012	AL. Electro. CAP.	16V 10uF						
C3025	K19149023	Ceramic CAP.	25V 0.068uF						
C3026	K40129012	AL. Electro. CAP.	16V 10uF						
C3027	K28129001	Ceramic CAP.	Y 16V 0.01uF						
C3028	K13179009	Ceramic CAP.	F 50V 0.047uF						
C3029	K13179009	Ceramic CAP.	F 50V 0.047uF						
C3030	K40179010	AL. Electro. CAP.	50V 0.47uF						
C3034	K40179005	AL. Electro. CAP.	50V 0.74uF						
C3035	K40129012	AL. Electro. CAP.	16V 10uF						
C3036	K13179008	Ceramic CAP.	F 50V 0.01uF						
C3037	K40179013	AL. Electro. CAP.	50V 1uF						
S3001	Q9000394	Rotary Code Switch							
S3002	N5090010	Tact Switch	KEG10904						
S3003	N5090010	Tact Switch	KEG10904						
S3004	N5090010	Tact Switch	KEG10904						
S3005	N5090010	Tact Switch	KEG10904						
S3006	N5090010	Tact Switch	KEG10904						
S3007	N5090010	Tact Switch	KEG10904						
S3008	N5090010	Tact Switch	KEG10904						
S3009	N5090010	Tact Switch	KEG10904						
S3010	N5090010	Tact Switch	KEG10904						
S3011	N5090010	Tact Switch	KEG10904						
S3012	N5090010	Tact Switch	KEG10904						
S3013	N5090010	Tact Switch	KEG10904						
S3014	N5090010	Tact Switch	KEG10904						
S3015	N4090081	Push Switch	SPH121C16						
S3016	N4090081	Push Switch	SPH121C16						
S3017	N4090081	Push Switch	SPH121C16						
S3018	N4090081	Push Switch	SPH121C16						
S3019	N6090061	Slide Switch	SSJ-012M						
J3002	P0090203	Connector	S02B-XH-A						
J3003	P0090638	Connector	SC25-0.5WL						
J3004	P0090637	Connector	SC25-0.3WL						
J3005	P0090639	Connector	SC25-0.6WL						
PL3001	Q1000010	Lamp	BQ041-22803A						
PL3002	Q1000010	Lamp	BQ041-22803A						
PL3003	Q1000010	Lamp	BQ041-22803A						
BAT 3001	Q9000106	Lithium Battery	CR2025-HM1						
	Q9000192	Sarcon	30F-TO-220						
	R0102810	Nut Board							
	R3124170A	Light Reflector							
	R0124180	Heatsink Plate							
	R7125120A	Filter							
	R7125420	Sponge							
	R7125440	Sponge							
	R7126160	Sponge Rubber							
	R7126480	Mylar Film							
	T9205611	Wire ASSY	JP1-P1						
	T9205612	Wire ASSY	JP2-P2						
	T9205613	Wire ASSY	JP3-P3						
	T9205626	Wire ASSY	JP4-P4						
	T9205636	Wire ASSY	JP5						
LPF UNIT									
Symbol No.	Part No.	Description	Device						
	F29480000	Printed Circuit Board							
	C029480AA	PCB with Components							
D4001	G2090408	Diode	1SS270						
D4002	G2090408	Diode	1SS270						
D4003	G2090244	Diode	1SS106						
D4004	Q9000375	Surge Absorber	DSP201M-SO0B						
R4002	J02225270	Carbon Film RES.	1/6W 27 ohm UJ						
R4003	J02225270	Carbon Film RES.	1/6W 27 ohm UJ						
C4001	K30275102	Mica CAP.	500V 1000pF						
C4002	K00275680	Ceramic CAP.	SL 500V 68pF						

PARTS LIST

C2107	K40129008	AL. Electro. CAP.		16V	33uF	T2004	L0021861	Coil		5.74MHz
C2108	K28129001	Ceramic CAP.	Y	16V	0.01uF	T2005	L0021380	Coil		0.40uH
C2109	K28129001	Ceramic CAP.	Y	16V	0.01uF	T2006	L0021860	Coil		0.45uH
C2111	K19149025	Ceramic CAP.		25V	0.1uF	T2007	L0021380	Coil		0.40uH
C2112	K40129038	AL. Electro. CAP.		16V	100uF	T2008	L0021380	Coil		0.40uH
						T2009	L0021382	Coil		0.29uH
C2113	K19149013	Ceramic CAP.		25V	0.01uF	J2001	P0090627	Connector		
C2114	K12171102	Ceramic CAP.	E	50V	1000uF	J2002	P1090554	Connector		
C2115	K06179008	Ceramic CAP.	UJ	50V	43uF	J2003	P1090594	Connector		
C2116	K02173070	Ceramic CAP.	CH	50V	7uF					
C2117	K06172050	Ceramic CAP.	UJ	50V	5uF		T9317814	Wire ASSY	P2001	
C2118	K06175330	Ceramic CAP.	UJ	50V	33uF		T9317813	Wire ASSY	P2002	
C2119	K06175150	Ceramic CAP.	UJ	50V	15uF		T9317812	Wire ASSY	P2003	
C2120	K12171102	Ceramic CAP.	E	50V	1000uF					
C2121	K12171102	Ceramic CAP.	E	50V	1000uF		R0124120	VCO Case		
C2122	K40129008	AL. Electro. CAP.		16V	33uF		R0124130	VCO Cover		
							R0124140A	Shield Plate		
C2123	K06175470	Ceramic CAP.	UJ	50V	47pF		R0124150A	Shield Plate		
C2124	K06172050	Ceramic CAP.	UJ	50V	5pF		R0124160B	Shield Plate		
C2125	K05175330	Ceramic CAP.	RH	50V	33pF		R0123770	Ground Lead		
C2126	K02173100	Ceramic CAP.	CH	50V	10pF		R0125800	Leaf Spring		
C2127	K12171102	Ceramic CAP.	E	50V	1000pF					
C2128	K40129008	AL. Electro. CAP.		16V	33uF					
C2129	K06175390	Ceramic CAP.	UJ	50V	39pF					
C2130	K06172050	Ceramic CAP.	UJ	50V	5pF	Symbol No.	Part No.	Description	Device	
C2131	K06175220	Ceramic CAP.	UJ	50V	22pF		F2971101A	Printed Circuit Board		
C2132	K06172050	Ceramic CAP.	UJ	50V	5pF		C029711AA	PCB with Components		
C2133	K12171102	Ceramic CAP.	E	50V	1000pF					
C2134	K40129008	AL. Electro. CAP.		16V	33uF					
C2135	K06179008	Ceramic CAP.	UJ	16V	43pF	Q7023	G3326207B	Transistor	2SC2620QBTR	
C2136	K05172050	Ceramic CAP.	RH	50V	5pF					
C2137	K05175180	Ceramic CAP.	RH	50V	18pF	R7069	J24205331	RES. Chip	1/10W 330 ohm	
C2138	K05172050	Ceramic CAP.	RH	50V	5pF	R7070	J24205104	RES. Chip	1/10W 100k ohm	
C2139	K12171102	Ceramic CAP.	E	50V	1000pF	R7071	J24205102	RES. Chip	1/10W 1k ohm	
C2140	K40129008	AL. Electro. CAP.		16V	33uF	R7072	J24205101	RES. Chip	1/10W 100 ohm	
						R7073	J24205101	RES. Chip	1/10W 100 ohm	
C2141	K12171102	Ceramic CAP.	E	50V	1000pF	C7081	K22170817	CAP. Chip	B 50V 0.01uF	
C2142	K12171102	Ceramic CAP.	E	50V	1000pF	C7088	K22170209	CAP. Chip	CH 50V 8pF	
C2143	K02172030	Ceramic CAP.	CH	50V	3pF	C7089	K22170204	CAP. Chip	CH 50V 3pF	
C2144	K12171102	Ceramic CAP.	E	50V	1000pF	C7090	K22170220	CAP. Chip	CH 50V 24pF	
C2145	K12171102	Ceramic CAP.	E	50V	1000pF	C7091	K22170209	CAP. Chip	CH 50V 8pF	
C2146	K10176331	Ceramic CAP.	B	50V	330pF	C7092	K22170219	CAP. Chip	CH 50V 22pF	
C2148	K00175270	Ceramic CAP.	SL	50V	27pF	C7093	K22170210	CAP. Chip	CH 50V 9pF	
C2149	K00175560	Ceramic CAP.	SL	50V	56pF	C7094	K22170219	CAP. Chip	CH 50V 22pF	
C2150	K00175270	Ceramic CAP.	SL	50V	27pF	C7095	K22170206	CAP. Chip	CH 50V 5pF	
C2151	K00179013	Ceramic CAP.	SL	50V	91pF	C7096	K22170221	CAP. Chip	CH 50V 27pF	
C2152	K00175470	Ceramic CAP.	SL	50V	47pF	C7097	K22170201	CAP. Chip	CH 50V 0.5pF	
C2153	K00179013	Ceramic CAP.	SL	50V	91pF	C7098	K22170817	CAP. Chip	B 50V 0.01uF	
C2154	K00175560	Ceramic CAP.	SL	50V	56pF	C7099	K22170817	CAP. Chip	B 50V 0.01uF	
C2155	K00175560	Ceramic CAP.	SL	50V	56pF	C7100	K22170817	CAP. Chip	B 50V 0.01uF	
C2157	K28129001	Ceramic CAP.	Y	16V	0.01uF	C7156	K22170213	CAP. Chip	CH 50V 12pF	
C2158	K12171102	Ceramic CAP.	E	50V	1000pF					
C2159	K12171102	Ceramic CAP.	E	50V	1000pF					
C2161	K00175101	Ceramic CAP.	SL	50V	100pF	L7022	L1190218	M. RFC		100uH
C2162	K28129001	Ceramic CAP.	Y	16V	0.01uF					
C2163	K13179009	Ceramic CAP.	F	50V	0.047uF	T7010	L0021553	Coil		
C2164	K19149025	Ceramic CAP.		25V	0.1uF	T7011	L0021554	Coil		
C2165	K00175470	Ceramic CAP.	SL	50V	47pF	T7012	L0021554	Coil		
C2166	K10176331	Ceramic CAP.	B	50V	330pF	T7013	L0021553	Coil		
						T7014	L0021555	Coil		
TC2001	K91000141	Trimmer CAP.			10pF					
TC2002	K91000142	Trimmer CAP.			20pF					
TC2003	K91000142	Trimmer CAP.			20pF					
TC2004	K91000186	Trimmer CAP.			20pF	Symbol No.	Part No.	Description	Device	
							F2943102C	Printed Circuit Board		
L2001	L1190223	M. RFC			270uH		C029432AA	PCB with Components		
L2002	L1190024	M. RFC			220uH					
L2003	L1190038	M. RFC			270uH					
L2004	L1190005	M. RFC			1uH					
L2010	L1190029	M. RFC			47uH					
L2011	L1190014	M. RFC			10uH	Q3001	G1090865	IC	M50932-501FP	
L2012	L1190011	M. RFC			4.7uH	Q3002	G1090815	IC	TDA2003H	
L2013	L1190005	M. RFC			1uH	Q3003	G1090299	IC	uPC7805H	
L2014	L0021410	Coil			0.147uH	Q3004	G1090840	IC	M51943BSL	
L2015	L0021410	Coil			0.147uH	Q3005	G3090074	Transistor	BA1A4M	
L2016	L0021409	Coil			0.117uH	Q3006	G3090074	Transistor	BA1A4M	
L2017	L0021409	Coil			0.117uH	Q3007	G3090079	Transistor	BA1A4P	
L2018	L1190190	M. RFC			0.27uH	Q3008	G3406670C	Transistor	2SD667C	
L2020	L1190218	M. RFC			100uH	Q3009	G3304580C	Transistor	2SC458C	
L2021	L1190218	M. RFC			100uH	Q3014	G3090075	Transistor	BA1A4P	
T2001	L0021862	Coil			44.6MHz	D3001	G2090118	Diode	1SS97	
T2002	L0021862	Coil			44.6MHz	D3002	G2090375	Diode	GL-9PR4	
T2003	L0021862	Coil			44.6MHz	D3005	G2090408	Diode	1SS270	
PLL-LPF UNIT										
Symbol No.	Part No.	Description	Device							
	F2971101A	Printed Circuit Board								
	C029711AA	PCB with Components								
Q7023	G3326207B	Transistor	2SC2620QBTR							
R7069	J24205331	RES. Chip	1/10W 330 ohm							
R7070	J24205104	RES. Chip	1/10W 100k ohm							
R7071	J24205102	RES. Chip	1/10W 1k ohm							
R7072	J24205101	RES. Chip	1/10W 100 ohm							
R7073	J24205101	RES. Chip	1/10W 100 ohm							
C7081	K22170817	CAP. Chip	B 50V 0.01uF							
C7088	K22170209	CAP. Chip	CH 50V 8pF							
C7089	K22170204	CAP. Chip	CH 50V 3pF							
C7090	K22170220	CAP. Chip	CH 50V 24pF							
C7091	K22170209	CAP. Chip	CH 50V 8pF							
C7092	K22170219	CAP. Chip	CH 50V 22pF							
C7093	K22170210	CAP. Chip	CH 50V 9pF							
C7094	K22170219	CAP. Chip	CH 50V 22pF							
C7095	K22170206	CAP. Chip	CH 50V 5pF							
C7096	K22170221	CAP. Chip	CH 50V 27pF							
C7097	K22170201	CAP. Chip	CH 50V 0.5pF							
C7098	K22170817	CAP. Chip	B 50V 0.01uF							
C7099	K22170817	CAP. Chip	B 50V 0.01uF							
C7100	K22170817	CAP. Chip	B 50V 0.01uF							
C7156	K22170213	CAP. Chip	CH 50V 12pF							
L7022	L1190218	M. RFC	100uH							
T7010	L0021553	Coil								
T7011	L0021554	Coil								
T7012	L0021554	Coil								
T7013	L0021553	Coil								
T7014	L0021555	Coil								
DISPLAY UNIT										
Symbol No.	Part No.	Description	Device							
	F2943102C	Printed Circuit Board								
	C029432AA	PCB with Components								
Q3001	G1090865	IC	M50932-501FP							
Q3002	G1090815	IC	TDA2003H							
Q3003	G1090299	IC	uPC7805H							
Q3004	G1090840	IC	M51943BSL							
Q3005	G3090074	Transistor	BA1A4M							
Q3006	G3090074	Transistor	BA1A4M							
Q3007	G3090079	Transistor	BA1A4P							
Q3008	G3406670C	Transistor	2SD667C							
Q3009	G3304580C	Transistor	2SC458C							
Q3014	G3090075	Transistor	BA1A4P							
T2001	L0021862	Coil		D3001	G2090118	Diode	1SS97			
T2002	L0021862	Coil		D3002	G2090375	Diode	GL-9PR4			
T2003	L0021862	Coil		D3005	G2090408	Diode	1SS270			

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R2037	J02225472	Carbon Film RES.	1/6W 4.7k ohm	UJ	C2011	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2038	J02225681	Carbon Film RES.	1/6W 680 ohm	UJ	C2012	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2039	J02225101	Carbon Film RES.	1/6W 100 ohm	UJ	C2013	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2040	J02225471	Carbon Film RES.	1/6W 470 ohm	UJ	C2014	K02175150	Ceramic CAP.	CH	50V	15pF	
R2041	J02225154	Carbon Film RES.	1/6W 150k ohm	UJ	C2015	K02173100	Ceramic CAP.	CH	50V	10pF	
R2042	J02225153	Carbon Film RES.	1/6W 15k ohm	UJ	C2016	K02175150	Ceramic CAP.	CH	50V	15pF	
R2043	J02225101	Carbon Film RES.	1/6W 100 ohm	UJ	C2017	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2044	J02225471	Carbon Film RES.	1/6W 470 ohm	UJ	C2018	K02175121	Ceramic CAP.	CH	50V	120pF	
R2045	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ	C2019	K02175820	Ceramic CAP.	CH	50V	82pF	
R2046	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ	C2020	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2047	J02225331	Carbon Film RES.	1/6W 330 ohm	UJ	C2021	K02173080	Ceramic CAP.	CH	50V	8pF	
R2048	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ	C2022	K02172050	Ceramic CAP.	CH	50V	5pF	
R2049	J02225223	Carbon Film RES.	1/6W 22k ohm	UJ	C2023	K19149021	Ceramic CAP.		25V	0.047uF	
R2050	J01225332	Carbon Film RES.	1/6W 3.3k ohm	PJ	C2024	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2051	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	C2025	K28179001	Ceramic CAP.		50V	1000pF	
R2052	J02225272	Carbon Film RES.	1/6W 2.7k ohm	UJ	C2026	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2053	J02225272	Carbon Film RES.	1/6W 2.7k ohm	UJ	C2027	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2054	J02225101	Carbon Film RES.	1/6W 100 ohm	UJ	C2028	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2055	J01225273	Carbon Film RES.	1/6W 27k ohm	PJ	C2029	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2056	J01225182	Carbon Film RES.	1/6W 1.8k ohm	PJ	C2030	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2057	J02225152	Carbon Film RES.	1/6W 1.5k ohm	UJ	C2031	K12171102	Ceramic CAP.	E	50V	1000pF	
R2058	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ	C2032	K00179001	Ceramic CAP.	SL	50V	0.5pF	
R2059	J01225221	Carbon Film RES.	1/6W 220 ohm	PJ	C2033	K00172030	Ceramic CAP.	SL	50V	3pF	
R2060	J01225221	Carbon Film RES.	1/6W 220 ohm	PJ	C2034	K12171102	Ceramic CAP.	E	50V	1000pF	
R2061	J01225221	Carbon Film RES.	1/6W 220 ohm	PJ	C2035	K12171102	Ceramic CAP.	E	50V	1000pF	
R2062	J02225221	Carbon Film RES.	1/6W 220 ohm	UJ	C2036	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2063	J02225101	Carbon Film RES.	1/6W 100 ohm	UJ	C2037	K00175101	Ceramic CAP.	SL	50V	100pF	
R2064	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ	C2038	K00173100	Ceramic CAP.	SL	50V	10pF	
R2065	J02225471	Carbon Film RES.	1/6W 470 ohm	UJ	C2039	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2066	J02225221	Carbon Film RES.	1/6W 220 ohm	UJ	C2040	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2067	J02225221	Carbon Film RES.	1/6W 220 ohm	UJ	C2041	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2068	J02225221	Carbon Film RES.	1/6W 220 ohm	UJ	C2042	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2075	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	C2043	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2076	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	C2044	K40129004	AL. Electro. CAP.		16V	10uF	
R2077	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ							
R2078	J01225682	Carbon Film RES.	1/6W 6.8k ohm	PJ	C2045	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2079	J01225182	Carbon Film RES.	1/6W 1.8k ohm	UJ	C2046	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2080	J01225272	Carbon Film RES.	1/6W 2.7k ohm	UJ	C2047	K10176561	Ceramic CAP.	B	50V	560pF	
R2081	J01225101	Carbon Film RES.	1/6W 100 ohm	UJ	C2048	K10176271	Ceramic CAP.	B	50V	270pF	
R2082	J02225152	Carbon Film RES.	1/6W 1.5k ohm	UJ	C2049	K10176102	Ceramic CAP.	B	50V	1000pF	
R2083	J01225332	Carbon Film RES.	1/6W 3.3k ohm	PJ	C2050	K10176101	Ceramic CAP.	B	50V	100pF	
R2084	J02225223	Carbon Film RES.	1/6W 22k ohm	UJ	C2051	K10176681	Ceramic CAP.	B	50V	680pF	
R2085	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ	C2052	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2086	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	C2053	K13179014	Ceramic CAP.	F	50V	0.0047uF	
R2087	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	C2054	K00175270	Ceramic CAP.	SL	50V	27pF	
R2088	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	C2055	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2089	J02225101	Carbon Film RES.	1/6W 100 ohm	UJ	C2056	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2090	J02225223	Carbon Film RES.	1/6W 22k ohm	UJ	C2057	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2091	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ	C2058	K12171102	Ceramic CAP.	E	50V	1000pF	
R2092	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	C2059	K12171102	Ceramic CAP.	E	50V	1000pF	
R2093	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	C2060	K40129008	AL. Electro. CAP.		16V	33uF	
R2094	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ							
R2095	J02225101	Carbon Film RES.	1/6W 100 ohm	UJ	C2061	K12171102	Ceramic CAP.	E	50V	1000pF	
R2096	J02225223	Carbon Film RES.	1/6W 22k ohm	UJ	C2062	K02179001	Ceramic CAP.	CH	50V	1pF	
R2097	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ	C2063	K05173080	Ceramic CAP.	RH	50V	8pF	
R2098	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	C2064	K02175270	Ceramic CAP.	CH	50V	27pF	
R2099	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	C2065	K02175150	Ceramic CAP.	CH	50V	15pF	
R2100	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	C2066	K06175220	Ceramic CAP.	UJ	50V	22pF	
R2101	J02225101	Carbon Film RES.	1/6W 100 ohm	UJ	C2067	K02173100	Ceramic CAP.	CH	50V	10pF	
R2102	J02225223	Carbon Film RES.	1/6W 22k ohm	UJ	C2068	K40179013	AL. Electro. CAP.		50V	1uF	
R2103	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ							
R2104	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	C2069	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2105	J02225153	Carbon Film RES.	1/6W 15k ohm	UJ	C2070	K40129008	AL. Electro. CAP.		16V	33uF	
R2106	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ							
R2107	J02225101	Carbon Film RES.	1/6W 100 ohm	UJ	C2071	K28129001	Ceramic CAP.	Y	16V	0.01uF	
R2108	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ	C2072	K19149017	Ceramic CAP.		25V	0.022uF	
R2109	J02225101	Carbon Film RES.	1/6W 100 ohm	UJ	C2073	K19149019	Ceramic CAP.		25V	0.033uF	
R2110	J02225471	Carbon Film RES.	1/6W 470 ohm	UJ	C2074	K40129008	AL. Electro. CAP.		16V	33uF	
R2111	J02225681	Carbon Film RES.	1/6W 680 ohm	UJ							
R2112	J02225471	Carbon Film RES.	1/6W 470 ohm	UJ	C2075	K10176101	Ceramic CAP.	B	50V	100pF	
R2113	J02225100	Carbon Film RES.	1/6W 10 ohm	UJ	C2076	K10176101	Ceramic CAP.	B	50V	100pF	
R2114	J02225560	Carbon Film RES.	1/6W 56 ohm	UJ	C2077	K10176101	Ceramic CAP.	B	50V	100pF	
R2116	J02225471	Carbon Film RES.	1/6W 470 ohm	UJ	C2078	K19149005	Ceramic CAP.		25V	0.0022uF	
R2120	J01225560	Carbon Film RES.	1/6W 56 ohm	PJ	C2079	K12171102	Ceramic CAP.	E	50V	1000pF	
					C2080	K28129001	Ceramic CAP.	Y	16V	0.01uF	
TH2001	G9090008	Thermistor	11-2102-2		C2082	K28129001	Ceramic CAP.	Y	16V	0.01uF	
					C2084	K12171102	Ceramic CAP.	E	50V	1000pF	
C2001	K12171102	Ceramic CAP.	E	50V	1000pF	C2085	K12171102	Ceramic CAP.	E	50V	1000pF
C2002	K02175560	Ceramic CAP.	CH	50V	56pF	C2086	K02179001	Ceramic CAP.	CH	50V	1pF
C2003	K02175150	Ceramic CAP.	CH	50V	15pF	C2087	K02172020	Ceramic CAP.	CH	50V	2pF
C2004	K12171102	Ceramic CAP.	E	50V	1000pF	C2101	K10176101	Ceramic CAP.	B	50V	100pF
C2005	K02172059	Ceramic CAP.	CH	50V	0.5pF	C2102	K10176101	Ceramic CAP.	B	50V	100pF
C2006	K02175120	Ceramic CAP.	CH	50V	12pF	C2103	K10176101	Ceramic CAP.	B	50V	100pF
C2007	K28179001	Ceramic CAP.	B	50V	1000pF	C2104	K06179007	Ceramic CAP.	UJ	50V	36pF
C2008	K02172030	Ceramic CAP.	CH	50V	3pF	C2105	K06175390	Ceramic CAP.	UJ	50V	39pF
C2009	K12171102	Ceramic CAP.	E	50V	1000pF	C2106	K40129004	AL. Electro. CAP.		16V	10uF
C2010	K12171102	Ceramic CAP.	E	50V	1000pF						

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T1020	L0020788A	Coil				Q2007	G3304580C	Transistor	2SC458C
T1021	L0020788A	Coil				Q2008	G3304580C	Transistor	2SC458C
RL1001	M1190056	Relay	FBR21D12 (DC12V)			Q2009	G1090012	IC	SN16913P
S1001	N6090033	Slide Switch				Q2010	G3304580C	Transistor	2SC458C
S1002	N6090033	Slide Switch				Q2011	G3304580C	Transistor	2SC458C
						Q2012	G1090012	IC	SN16913P
						Q2013	G1090838	IC	M54459L
						Q2014	G1090280	IC	uPD4013BC
						Q2015	G3304580C	Transistor	2SC458C
						Q2016	G3305350B	Transistor	2SC535B
						Q2017	G3801921G	Transistor	2SK192AGR
						Q2018	G1090834	IC	CX-1925B
						Q2019	G3801840Y	FET	2SK184Y
						Q2020	G3307320B	Transistor	2SC732TMBL
						Q2021	G1090101	IC	uPC1037H
						Q2022	G3305350B	Transistor	2SC535B
						Q2024	G1090834	IC	CX-7925B
						Q2025	G3304580C	Transistor	2SC458C
						Q2026	G3801840Y	FET	2SK184Y
						Q2027	G3307320B	Transistor	2SC732TMBL
						Q2028	G3305350B	Transistor	2SC535B
						Q2029	G3305350B	Transistor	2SC535B
						Q2030	G3305350B	Transistor	2SC535B
						Q2031	G3305350B	Transistor	2SC535B
						Q2032	G3305350B	Transistor	2SC535B
						Q2034	G3320530	Transistor	2SC2053
						D2001	G2090408	Diode	1SS270
						D2002	G2090408	Diode	1SS270
						D2003	G2090027	Diode	1SS53
						D2004	G2090027	Diode	1SS53
						D2005	G2090180	Diode	FC-53M-5
						D2006	G2090408	Diode	1SS270
						D2007	G2060004	Diode	1SS270 TJ
						D2008	G2090161	Diode	1SV55
						D2009	G2090237	Diode	MA190
						D2010	G2090027	Diode	1SS53
						D2011	G2090161	Diode	1SV55
						D2012	G2090027	Diode	1SS53
						D2013	G2090161	Diode	1SV55
						D2014	G2090027	Diode	1SS53
						D2015	G2090161	Diode	1SV55
						D2016	G2090027	Diode	1SS53
						X2001	H0102853	XTAL	HC-48/U 38.840MHz
						X2002	H0102852	XTAL	HC-48/U 8.2165MHz
						X2003	H0102851	XTAL	HC-48/U 8.2135MHz
						X2004	H0102850	XTAL	HC-48/U 5.400MHz
						CF2001	H3900390	Ceramic Filter	SFT-5.74MA
						R2001	J02225472	Carbon Film RES.	1/6W 4.7k ohm UJ
						R2002	J02225472	Carbon Film RES.	1/6W 4.7k ohm UJ
						R2003	J02225101	Carbon Film RES.	1/6W 100 ohm UJ
						R2004	J02225471	Carbon Film RES.	1/6W 470 ohm UJ
						R2005	J02225154	Carbon Film RES.	1/6W 150k ohm UJ
						R2006	J02225101	Carbon Film RES.	1/6W 100 ohm UJ
						R2007	J02225471	Carbon Film RES.	1/6W 470 ohm UJ
						R2008	J02225683	Carbon Film RES.	1/6W 68k ohm UJ
						R2009	J02225470	Carbon Film RES.	1/6W 47 ohm UJ
						R2010	J02225101	Carbon Film RES.	1/6W 100 ohm UJ
						R2011	J02225103	Carbon Film RES.	1/6W 10k ohm UJ
						R2012	J02225101	Carbon Film RES.	1/6W 100 ohm UJ
						R2013	J02225101	Carbon Film RES.	1/6W 100 ohm UJ
						R2014	J02225472	Carbon Film RES.	1/6W 4.7k ohm UJ
						R2015	J02225472	Carbon Film RES.	1/6W 4.7k ohm UJ
						R2016	J02225102	Carbon Film RES.	1/6W 1k ohm UJ
						R2017	J02225223	Carbon Film RES.	1/6W 22k ohm UJ
						R2018	J02225103	Carbon Film RES.	1/6W 10k ohm UJ
						R2019	J02225102	Carbon Film RES.	1/6W 1k ohm UJ
						R2020	J02225683	Carbon Film RES.	1/6W 68k ohm UJ
						R2021	J01225470	Carbon Film RES.	1/6W 47 ohm PJ
						R2022	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
						R2023	J02225101	Carbon Film RES.	1/6W 100 ohm UJ
						R2024	J02225223	Carbon Film RES.	1/6W 22k ohm UJ
						R2025	J02225103	Carbon Film RES.	1/6W 10k ohm UJ
						R2026	J01225470	Carbon Film RES.	1/6W 47 ohm UJ
						R2027	J02225471	Carbon Film RES.	1/6W 470 ohm UJ
						R2028	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
						R2029	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
						R2030	J02225471	Carbon Film RES.	1/6W 470 ohm UJ
						R2031	J02225470	Carbon Film RES.	1/6W 47 ohm UJ
						R2032	J02225223	Carbon Film RES.	1/6W 22k ohm UJ
						R2033	J02225103	Carbon Film RES.	1/6W 10k ohm UJ
						R2034	J01225681	Carbon Film RES.	1/6W 680 ohm PJ
						R2035	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
						R2036	J02225472	Carbon Film RES.	1/6W 4.7k ohm UJ

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C1160	K00175220	Ceramic CAP.	SL	50V	22pF	C1235	K40179001	AL. Electro. CAP.	50V	1uF
C1161	K40129004	AL. Electro. CAP.		16V	10uF	C1236	K40179001	AL. Electro. CAP.	50V	1uF
C1162	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1237	K40179001	AL. Electro. CAP.	50V	1uF
C1163	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1238	K40129004	AL. Electro. CAP.	16V	10uF
C1164	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1239	K19149025	Ceramic CAP.	25V	0.1uF
C1165	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1240	K13179009	Ceramic CAP.	F	50V 0.047uF
C1166	K28129001	Ceramic CAP.	Y	16V	0.01uF	CB1001	K80000013	CAP. Block	50V	0.1uFx7
C1167	K13179009	Ceramic CAP.	F	50V	0.047uF	L1001	L1190227	M. RFC		560uH
C1168	K28129001	Ceramic CAP.	Y	16V	0.01uF	L1002	L0021221	Coil		0.17uH
C1169	K28129001	Ceramic CAP.	Y	16V	0.01uF	L1003	L0021222	Coil		0.24uH
C1170	K28129001	Ceramic CAP.	Y	16V	0.01uF	L1004	L1190220	M. RFC		150uH
C1171	K28179001	Ceramic CAP.	B	50V	1000pF	L1006	L1190210	M. RFC		22uH
C1172	K28179001	Ceramic CAP.	B	50V	1000pF	L1008	L1190210	M. RFC		22uH
C1173	K28129001	Ceramic CAP.	Y	16V	0.01uF	L1009	L1190189	M. RFC		1mH
C1174	K00175470	Ceramic CAP.	SL	50V	47pF	L1010	L1190209	M. RFC		18uF
C1175	K00172020	Ceramic CAP.	SL	50V	2pF	L1011	L1190208	M. RFC		15uF
C1176	K00175470	Ceramic CAP.	SL	50V	47pF	L1012	L1190205	M. RFC		6.8uF
C1177	K28179001	Ceramic CAP.	B	50V	1000pF	L1013	L1190208	M. RFC		15uF
C1178	K12171102	Ceramic CAP.	E	50V	1000pF	L1014	L1190209	M. RFC		18uF
C1179	K00175120	Ceramic CAP.	SL	50V	12pF	L1015	L1190207	M. RFC		12uF
C1180	K19149021	Ceramic CAP.		25V	0.047uF	L1016	L1190206	M. RFC		8.2uF
C1181	K19149025	Ceramic CAP.		25V	0.1uF	L1017	L1190202	M. RFC		3.9uF
C1182	K19149021	Ceramic CAP.		25V	0.047uF	L1018	L1190206	M. RFC		8.2uF
C1183	K50177223	Film CAP.		50V	0.022uF	L1019	L1190207	M. RFC		12uF
C1184	K50177223	Film CAP.		50V	0.022uF	L1020	L1190205	M. RFC		6.8uF
C1185	K50177223	Film CAP.		50V	0.022uF	L1021	L1190203	M. RFC		4.7uF
C1186	K40149001	AL. Electro. CAP.		25V	4.7uF	L1022	L1190199	M. RFC		2.2uF
C1187	K40129012	AL. Electro. CAP.		16V	10uF	L1023	L1190203	M. RFC		4.7uF
C1188	K50170014	Film CAP.		50V	0.01uF	L1024	L1190205	M. RFC		6.8uF
C1190	K13179009	Ceramic CAP.	F	50V	0.047uF	L1025	L1190200	M. RFC		2.7uF
C1191	K19149021	Ceramic CAP.		25V	0.047uF	L1026	L1190202	M. RFC		3.9uF
C1192	K19149003	Ceramic CAP.		25V	1500pF	L1027	L1190195	M. RFC		0.82uF
C1193	K19149025	Ceramic CAP.		25V	0.1uF	L1028	L1190202	M. RFC		3.9uF
C1194	K13179009	Ceramic CAP.	F	50V	0.047uF	L1029	L1190200	M. RFC		2.7uF
C1195	K13179009	Ceramic CAP.	F	50V	0.047uF	L1030	L1190198	M. RFC		1.8uF
C1196	K70167224	Tantalum CAP.		40V	0.22uF	L1031	L1190199	M. RFC		2.2uF
C1197	K28129001	Ceramic CAP.	Y	16V	0.01uF	L1032	L1190192	M. RFC		0.47uF
C1198	K28129001	Ceramic CAP.	Y	16V	0.01uF	L1033	L1190199	M. RFC		2.2uF
C1200	K40129012	AL. Electro. CAP.		16V	10uF	L1034	L1190198	M. RFC		1.8uF
C1201	K40179005	AL. Electro. CAP.		50V	0.47uF	L1035	L1190189	M. RFC		1mH
C1202	K40149011	AL. Electro. CAP.		25V	4.7uF	L1036	L1190187	M. RFC		1.5uH
C1203	K28129001	Ceramic CAP.	Y	16V	0.01uF	L1037	L1190220	M. RFC		150uH
C1204	K28179001	Ceramic CAP.	B	50V	1000pF	L1038	L1190220	M. RFC		150uH
C1205	K28179001	Ceramic CAP.	B	50V	1000pF	L1039	L1190040	M. RFC		1mH
C1206	K28179001	Ceramic CAP.	B	50V	1000pF	L1040	L1190220	M. RFC		150uH
C1207	K28179001	Ceramic CAP.	B	50V	1000pF	L1041	L1190188	M. RFC		0.22uH
C1208	K22170817	CAP. Chip	B	50V	0.01uF	L1042	L1190090	M. RFC		1mH
C1209	K19149021	Ceramic CAP.		25V	0.047uF	L1043	L1190218	M. RFC		100uH
C1210	K40129007	AL. Electro. CAP.		16V	100uF	L1044	L1190204	M. RFC		5.6uH
C1211	K00175471	Ceramic CAP.	SL	50V	470pF	L1045	L1190214	M. RFC		47uH
C1212	K40129006	AL. Electro. CAP.		16V	470uF	L1046	L1190218	M. RFC		100uH
C1213	K13179009	Ceramic CAP.	F	50V	0.047uF	L1047	L1190123	M. RFC		3.9mH
C1214	K22170817	CAP. Chip	B	50V	0.01uF	L1048	L1190040	M. RFC		1mH
C1215	K40129004	AL. Electro. CAP.		16V	10uF	L1049	L1190123	M. RFC		3.9mH
C1216	K28129001	Ceramic CAP.	Y	16V	0.01uF	L1050	L1190218	M. RFC		100uH
C1217	K13179009	Ceramic CAP.	F	50V	0.047uF	L1052	L1190220	M. RFC		150uH
C1218	K22171008	CAP. Chip	F	50V	0.047uF	L1053	L1190037	M. RFC		150uH
C1219	K22171008	CAP. Chip	F	50V	0.047uF	L1054	L1190190	M. RFC		0.27uH
C1220	K00175510	Ceramic CAP.	SL	50V	51pF	L1056	L1190189	M. RFC		1mH
C1221	K00175510	Ceramic CAP.	SL	50V	51pF	L1057	L1190190	M. RFC		0.27uH
C1222	K28129001	Ceramic CAP.	Y	16V	0.01uF	L1058	L1190148	M. RFC		10uH
C1223	K13179009	Ceramic CAP.	F	50V	0.047uF	T1001	L0020788A	Coil		
C1224	K40129016	AL. Electro. CAP.		16V	22uF	T1002	L0021351	Coil		
C1225	K28129001	Ceramic CAP.	Y	16V	0.01uF	T1003	L0020225	Coil		47.1MHz
C1226	K19149023	Ceramic CAP.		25V	0.068uF	T1004	L0020224	Coil		47.1MHz
C1227	K40179009	AL. Electro. CAP.		50V	2.2uF	T1005	L0020482	Coil		47.0MHz
C1228	K40179001	AL. Electro. CAP.		50V	1uF	T1006	L0020858	Coil		48.0MHz
C1229	K40129013	AL. Electro. CAP.		16V	22uF	T1007	L0021199	Coil		8.2MHz
C1230	K40129012	AL. Electro. CAP.		16V	10uF	T1008	L0021199	Coil		8.2MHz
C1231	K00175470	Ceramic CAP.	SL	50V	47pF	T1009	L0021199	Coil		8.2MHz
C1232	K00175560	Ceramic CAP.	SL	50V	56pF	T1010	L0021199	Coil		8.2MHz
C1233	K28179001	Ceramic CAP.	B	50V	1000pF	T1011	L0021199	Coil		8.2MHz
C1234	K28129001	Ceramic CAP.	Y	16V	0.01uF	T1012	L0021199	Coil		8.2MHz
						T1013	L0021192	Coil		8.2MHz
						T1014	L0021199	Coil		8.2MHz
						T1015	L0021199	Coil		8.2MHz
						T1016	L0021195	Coil		8.21MHz
						T1017	L0021225	Coil		47.1MHz
						T1018	L0021225	Coil		47.1MHz
						T1019	L0021225	Coil		47.1MHz

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C1001	K19149025	Ceramic CAP.		25V	0.1uF	C1089	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1002	K13179009	Ceramic CAP.	F	50V	0.047uF	C1090	K19149025	Ceramic CAP.		25V	0.1uF
C1003	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1091	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1004	K00175680	Ceramic CAP.	SL	50V	68pF	C1092	K12171102	Ceramic CAP.	E	50V	1000pF
C1005	K00175820	Ceramic CAP.	SL	50V	82pF	C1093	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1006	K00175151	Ceramic CAP.	SL	50V	150pF	C1094	K19149025	Ceramic CAP.		25V	0.1uF
C1007	K00175220	Ceramic CAP.	SL	50V	22pF	C1095	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1008	K13179009	Ceramic CAP.	F	50V	0.047uF	C1097	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1009	K00179011	Ceramic CAP.	SL	50V	62pF	C1098	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1010	K19149025	Ceramic CAP.		25V	0.1uF	C1099	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1011	K19149025	Ceramic CAP.		25V	0.1uF	C1100	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1012	K40129004	AL. Electro. CAP.		16V	10uF	C1102	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1013	K19149021	Ceramic CAP.		25V	0.047uF	C1103	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1014	K00175221	Ceramic CAP.	SL	50V	220pF	C1104	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1017	K00175511	Ceramic CAP.	SL	50V	510pF	C1105	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1019	K00175221	Ceramic CAP.	SL	50V	220pF	C1106	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1020	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1107	K00173100	Ceramic CAP.	SL	50V	10pF
C1021	K40129004	AL. Electro. CAP.		16V	10uF	C1108	K40179006	AL. Electro. CAP.		50V	2.2uF
C1022	K00175151	Ceramic CAP.	SL	50V	150pF	C1109	K28179001	Ceramic CAP.	B	50V	1000pF
C1023	K13179009	Ceramic CAP.	F	50V	0.047uF	C1110	K00175101	Ceramic CAP.	SL	50V	100pF
C1024	K00175181	Ceramic CAP.	SL	50V	180pF	C1111	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1025	K00175471	Ceramic CAP.	SL	50V	470pF	C1112	K00175101	Ceramic CAP.	SL	50V	100pF
C1026	K00175181	Ceramic CAP.	SL	50V	180pF	C1113	K40129013	AL. Electro. CAP.		16V	22uF
C1027	K00175151	Ceramic CAP.	SL	50V	150pF	C1114	K00175221	Ceramic CAP.	SL	50V	220pF
C1028	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1115	K50170015	Film CAP.		50V	0.022uF
C1029	K40129004	AL. Electro. CAP.		16V	10uF	C1116	K40179001	AL. Electro. CAP.		50V	1uF
C1030	K00175680	Ceramic CAP.	SL	50V	68pF	C1117	K13179009	Ceramic CAP.	F	50V	0.047uF
C1031	K13179009	Ceramic CAP.	F	50V	0.047uF	C1118	K70147155	Tantalum CAP.		25V	1.5uF
C1032	K00175121	Ceramic CAP.	SL	50V	120pF	C1119	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1033	K00175221	Ceramic CAP.	SL	50V	220pF	C1120	K12171102	Ceramic CAP.	E	50V	1000pF
C1034	K00175121	Ceramic CAP.	SL	50V	120pF	C1121	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1035	K00175680	Ceramic CAP.	SL	50V	68pF	C1122	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1036	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1123	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1037	K40129004	AL. Electro. CAP.		16V	10uF	C1124	K40179001	AL. Electro. CAP.		50V	1uF
C1038	K00175390	Ceramic CAP.	SL	50V	39pF	C1125	K40129012	AL. Electro. CAP.		16V	10uF
C1039	K13179009	Ceramic CAP.	F	50V	0.047uF	C1126	K40129012	AL. Electro. CAP.		16V	10uF
C1040	K00175680	Ceramic CAP.	SL	50V	68pF	C1127	K40149011	AL. Electro. CAP.		25V	4.7uF
C1041	K00175151	Ceramic CAP.	SL	50V	150pF	C1128	K50170007	Film CAP.		50V	0.001uF
C1042	K00175680	Ceramic CAP.	SL	50V	68pF	C1129	K50170009	Film CAP.		50V	0.0022uF
C1043	K00175390	Ceramic CAP.	SL	50V	39pF	C1130	K50170011	Film CAP.		50V	0.0047uF
C1044	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1131	K40129012	AL. Electro. CAP.		16V	10uF
C1045	K40129004	AL. Electro. CAP.		16V	10uF	C1132	K40129012	AL. Electro. CAP.		16V	10uF
C1046	K00175330	Ceramic CAP.	SL	50V	33pF	C1133	K50177222	Film CAP.		50V	0.0022uF
C1047	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1134	K40149011	AL. Electro. CAP.		25V	4.7uF
C1048	K00175270	Ceramic CAP.	SL	50V	27pF	C1135	K40129012	AL. Electro. CAP.		16V	10uF
C1049	K00175121	Ceramic CAP.	SL	50V	120pF	C1136	K40179005	AL. Electro. CAP.		50V	0.47uF
C1050	K00175270	Ceramic CAP.	SL	50V	27pF	C1137	K28179001	Ceramic CAP.	B	50V	1000pF
C1051	K00175330	Ceramic CAP.	SL	50V	33pF	C1138	K40129012	AL. Electro. CAP.		16V	10uF
C1052	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1142	K28179001	Ceramic CAP.	B	50V	1000pF
C1053	K40129004	AL. Electro. CAP.		16V	10uF	C1143	K40179013	AL. Electro. CAP.		50V	1uF
C1054	K00173080	Ceramic CAP.	SL	50V	8pF	C1144	K28179001	Ceramic CAP.	B	50V	1000pF
C1055	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1145	K40129012	AL. Electro. CAP.		16V	10uF
C1056	K00175180	Ceramic CAP.	SL	50V	18pF	C1146	K28129001	Ceramic CAP.	B	16V	0.01uF
C1057	K00175101	Ceramic CAP.	SL	50V	100pF	C1147	K28129001	Ceramic CAP.	B	16V	1000pF
C1058	K00175180	Ceramic CAP.	SL	50V	18pF	C1148	K40129012	AL. Electro. CAP.		16V	10uF
C1059	K00175150	Ceramic CAP.	SL	50V	15pF	C1149	K40149011	AL. Electro. CAP.		25V	4.7uF
C1060	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1150	K40149011	AL. Electro. CAP.		25V	4.7uF
C1061	K40129004	AL. Electro. CAP.		16V	10uF	C1151	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1062	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1152	K40129013	AL. Electro. CAP.		16V	22uF
C1063	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1153	K28179001	Ceramic CAP.	B	50V	1000pF
C1064	K13179009	Ceramic CAP.	F	50V	0.047uF	C1154	K40149011	AL. Electro. CAP.		25V	4.7uF
C1065	K00173100	Ceramic CAP.	SL	50V	10pF	C1155	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1068	K13179009	Ceramic CAP.	F	50V	0.047uF	C1156	K00175220	Ceramic CAP.	Y	50V	22pF
C1069	K13179009	Ceramic CAP.	F	50V	0.047uF	C1157	K40149011	AL. Electro. CAP.		25V	4.7uF
C1070	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1158	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1071	K28129001	Ceramic CAP.	Y	16V	0.01uF	C1159	K28129001	Ceramic CAP.	Y	16V	0.01uF
C1073	K13179009	Ceramic CAP.	F	50V	0.047uF						
C1074	K00175470	Ceramic CAP.	SL	50V	47pF						
C1075	K00175101	Ceramic CAP.	SL	50V	100pF						
C1076	K28129001	Ceramic CAP.	Y	16V	0.01uF						
C1077	K13179009	Ceramic CAP.	F	50V	0.047uF						
C1078	K28129001	Ceramic CAP.	Y	16V	0.01uF						
C1079	K22170805	CAP. Chip	B	50V	1000pF						
C1080	K28129001	Ceramic CAP.	Y	16V	0.01uF						
C1081	K28179001	Ceramic CAP.	B	50V	1000pF						
C1082	K22170805	CAP. Chip	B	50V	1000pF						
C1083	K28129001	Ceramic CAP.	Y	16V	0.01uF						
C1085	K00175101	Ceramic CAP.	SL	50V	100pF						
C1087	K00173100	Ceramic CAP.	SL	50V	10pF						
C1088	K19149021	Ceramic CAP.		25V	0.047uF						

PARTS LIST

R1068	J02225222	Carbon Film RES.	1/6W 2.2k ohm	UJ	R1167	J01225470	Carbon Film RES.	1/6W 47 ohm	PJ
R1069	J02225102	Carbon Film RES.	1/6W 1k ohm	UJ	R1168	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ
R1070	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ	R1169	J01225680	Carbon Film RES.	1/6W 68 ohm	PJ
R1071	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ	R1170	J01225102	Carbon Film RES.	1/6W 1k ohm	PJ
R1072	J02225682	Carbon Film RES.	1/6W 6.8k ohm	UJ	R1172	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ
R1073	J02225472	Carbon Film RES.	1/6W 4.7k ohm	UJ	R1173	J02225333	Carbon Film RES.	1/6W 33k ohm	UJ
R1074	J02225155	Carbon Film RES.	1/6W 1.5M ohm	UJ	R1174	J02225472	Carbon Film RES.	1/6W 4.7k ohm	UJ
R1075	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	R1175	J02225472	Carbon Film RES.	1/6W 4.7k ohm	UJ
R1076	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	R1176	J02225472	Carbon Film RES.	1/6W 4.7k ohm	UJ
R1077	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	R1177	J02225472	Carbon Film RES.	1/6W 4.7k ohm	UJ
R1078	J02225473	Carbon Film RES.	1/6W 47k ohm	UJ	R1178	J01225331	Carbon Film RES.	1/6W 330 ohm	PJ
R1079	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ	R1179	J02225224	Carbon Film RES.	1/6W 220k ohm	UJ
R1080	J02225102	Carbon Film RES.	1/6W 1k ohm	UJ	R1180	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ
R1082	J02225152	Carbon Film RES.	1/6W 1.5k ohm	UJ	R1181	J02225101	Carbon Film RES.	1/6W 100 ohm	UJ
R1083	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ	R1182	J01225102	Carbon Film RES.	1/6W 1k ohm	PJ
R1084	J01225682	Carbon Film RES.	1/6W 6.8k ohm	PJ	R1183	J01225681	Carbon Film RES.	1/6W 680 ohm	PJ
R1087	J01225392	Carbon Film RES.	1/6W 3.9k ohm	PJ	R1184	J01225152	Carbon Film RES.	1/6W 1.5k ohm	PJ
R1088	J01225564	Carbon Film RES.	1/6W 560k ohm	PJ	R1185	J02225479	Carbon Film RES.	1/6W 4.7 ohm	UJ
R1089	J01225104	Carbon Film RES.	1/6W 100k ohm	PJ	R1186	J02225181	Carbon Film RES.	1/6W 180 ohm	UJ
R1090	J01225472	Carbon Film RES.	1/6W 4.7k ohm	PJ	R1187	J01225391	Carbon Film RES.	1/6W 390 ohm	PJ
R1091	J01225104	Carbon Film RES.	1/6W 100k ohm	PJ	R1188	J01225102	Carbon Film RES.	1/6W 1k ohm	PJ
R1092	J01225225	Carbon Film RES.	1/6W 2.2M ohm	PJ	R1189	J01225221	Carbon Film RES.	1/6W 220 ohm	PJ
R1094	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ	R1190	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ
R1095	J01225222	Carbon Film RES.	1/6W 2.2k ohm	PJ	R1191	J01225104	Carbon Film RES.	1/6W 100k ohm	PJ
R1096	J01225472	Carbon Film RES.	1/6W 4.7k ohm	PJ	R1192	J01225104	Carbon Film RES.	1/6W 100k ohm	PJ
R1097	J02225223	Carbon Film RES.	1/6W 22k ohm	UJ	R1193	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ
R1098	J01225471	Carbon Film RES.	1/6W 470 ohm	PJ	R1194	J01225823	Carbon Film RES.	1/6W 82k ohm	PJ
R1099	J02225472	Carbon Film RES.	1/6W 4.7k ohm	UJ	R1195	J02225562	Carbon Film RES.	1/6W 5.6k ohm	UJ
R1100	J01225102	Carbon Film RES.	1/6W 1k ohm	PJ	R1197	J01225154	Carbon Film RES.	1/6W 150k ohm	PJ
R1101	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ	R1198	J02225473	Carbon Film RES.	1/6W 47k ohm	UJ
R1102	J01225682	Carbon Film RES.	1/6W 6.8k ohm	PJ	R1200	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ
R1103	J01225682	Carbon Film RES.	1/6W 6.8k ohm	PJ	R1201	J02225105	Carbon Film RES.	1/6W 1M ohm	UJ
R1104	J02225682	Carbon Film RES.	1/6W 6.8k ohm	UJ	R1202	J02225333	Carbon Film RES.	1/6W 33k ohm	UJ
R1105	J01225154	Carbon Film RES.	1/6W 150k ohm	PJ	R1203	J01225223	Carbon Film RES.	1/6W 22k ohm	PJ
R1106	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ	R1204	J01225334	Carbon Film RES.	1/6W 330k ohm	PJ
R1107	J01225102	Carbon Film RES.	1/6W 1k ohm	PJ	R1206	J01225104	Carbon Film RES.	1/6W 100k ohm	PJ
R1108	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ	R1208	J02225472	Carbon Film RES.	1/6W 4.7k ohm	UJ
R1109	J01225223	Carbon Film RES.	1/6W 22k ohm	PJ	R1209	J02225562	Carbon Film RES.	1/6W 5.6k ohm	UJ
R1110	J02225683	Carbon Film RES.	1/6W 68k ohm	UJ	R1210	J02225153	Carbon Film RES.	1/6W 15k ohm	UJ
R1111	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ	R1211	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ
R1112	J02225332	Carbon Film RES.	1/6W 3.3k ohm	UJ	R1212	J01225221	Carbon Film RES.	1/6W 220 ohm	PJ
R1113	J02225220	Carbon Film RES.	1/6W 22 ohm	UJ	R1213	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ
R1114	J02225102	Carbon Film RES.	1/6W 1k ohm	UJ	R1214	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ
R1115	J02225101	Carbon Film RES.	1/6W 100 ohm	UJ	R1216	J02225472	Carbon Film RES.	1/6W 4.7k ohm	UJ
R1116	J01225332	Carbon Film RES.	1/6W 3.3k ohm	PJ	R1217	J01225104	Carbon Film RES.	1/6W 100k ohm	PJ
R1117	J02225472	Carbon Film RES.	1/6W 4.7k ohm	UJ	R1218	J01225823	Carbon Film RES.	1/6W 82k ohm	PJ
R1119	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ	R1219	J02225222	Carbon Film RES.	1/6W 2.2k ohm	UJ
R1120	J01225102	Carbon Film RES.	1/6W 1k ohm	PJ	R1220	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ
R1121	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ	R1221	J02225102	Carbon Film RES.	1/6W 1k ohm	UJ
R1122	J01225223	Carbon Film RES.	1/6W 22k ohm	PJ	R1222	J02225221	Carbon Film RES.	1/6W 220 ohm	UJ
R1123	J01225331	Carbon Film RES.	1/6W 330 ohm	PJ	R1223	J02225221	Carbon Film RES.	1/6W 220 ohm	UJ
R1124	J01225153	Carbon Film RES.	1/6W 15k ohm	PJ	R1224	J02225221	Carbon Film RES.	1/6W 220 ohm	UJ
R1125	J01225222	Carbon Film RES.	1/6W 2.2k ohm	PJ	R1225	J02225221	Carbon Film RES.	1/6W 220 ohm	UJ
R1126	J01225151	Carbon Film RES.	1/6W 150 ohm	PJ	R1226	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ
R1127	J01225221	Carbon Film RES.	1/6W 220 ohm	PJ	R1227	J01225103	Carbon Film RES.	1/6W 10k ohm	PJ
R1130	J02225222	Carbon Film RES.	1/6W 2.2k ohm	UJ	R1230	J20249046	Metal Film RES.	1/4W 8.87k ohm	
R1131	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ	R1231	J20249102	Metal Film RES.	1/4W 1.43k ohm	
R1132	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ	R1233	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ
R1133	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ	R1234	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ
R1134	J01225681	Carbon Film RES.	1/6W 680 ohm	PJ	R1235	J02225473	Carbon Film RES.	1/6W 47k ohm	UJ
R1135	J01225221	Carbon Film RES.	1/6W 220 ohm	PJ	R1236	J02225103	Carbon Film RES.	1/6W 10k ohm	UJ
R1136	J02225102	Carbon Film RES.	1/6W 1k ohm	UJ	R1237	J01225471	Carbon Film RES.	1/6W 470 ohm	PJ
R1137	J01225102	Carbon Film RES.	1/6W 1k ohm	PJ	R1238	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ
R1138	J01225153	Carbon Film RES.	1/6W 15k ohm	PJ	R1239	J01225473	Carbon Film RES.	1/6W 47k ohm	PJ
R1139	J01225104	Carbon Film RES.	1/6W 100k ohm	PJ	R1240	J01225561	Carbon Film RES.	1/6W 560 ohm	PJ
R1140	J02225222	Carbon Film RES.	1/6W 2.2k ohm	UJ	R1241	J01225683	Carbon Film RES.	1/6W 68k ohm	PJ
R1141	J01225102	Carbon Film RES.	1/6W 1k ohm	PJ	R1242	J01225102	Carbon Film RES.	1/6W 1k ohm	PJ
R1142	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ	R1243	J02225152	Carbon Film RES.	1/6W 1.5k ohm	UJ
R1143	J01225102	Carbon Film RES.	1/6W 1k ohm	PJ	R1244	J01225221	Carbon Film RES.	1/6W 220 ohm	PJ
R1144	J01225223	Carbon Film RES.	1/6W 22k ohm	PJ	R1245	J02225104	Carbon Film RES.	1/6W 100k ohm	UJ
R1145	J01225102	Carbon Film RES.	1/6W 1k ohm	PJ	R1246	J02225102	Carbon Film RES.	1/6W 1k ohm	UJ
R1146	J01225221	Carbon Film RES.	1/6W 220 ohm	PJ					
R1147	J01225331	Carbon Film RES.	1/6W 330 ohm	PJ	VR1001	J51745472	POT.	B 4.7k ohm	
R1148	J02225272	Carbon Film RES.	1/6W 2.7k ohm	UJ	VR1002	J51745103	POT.	B 10k ohm	
R1149	J01225681	Carbon Film RES.	1/6W 680 ohm	PJ	VR1003	J51745105	POT.	B 1M ohm	
R1150	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ	VR1004	J51745102	POT.	B 1k ohm	
R1151	J02225221	Carbon Film RES.	1/6W 220 ohm	UJ	VR1005	J51745474	POT.	B 470k ohm	
R1152	J01225472	Carbon Film RES.	1/6W 4.7k ohm	PJ	VR1006	J51745103	POT.	B 10k ohm	
R1153	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ	VR1007	J51745103	POT.	B 10k ohm	
R1155	J02225332	Carbon Film RES.	1/6W 3.3k ohm	UJ	VR1008	J51723103	POT.	B 10k ohm	
R1157	J01225224	Carbon Film RES.	1/6W 220k ohm	PJ	VR1009	J51745472	POT.	B 4.7k ohm	
R1158	J01225471	Carbon Film RES.	1/6W 470 ohm	PJ	VR1010	J51745103	POT.	B 10k ohm	
R1159	J01225471	Carbon Film RES.	1/6W 470 ohm	PJ	VR1011	J51745474	POT.	B 470k ohm	
R1160	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ	VR1012	J51745103	POT.	B 10k ohm	
R1161	J01225101	Carbon Film RES.	1/6W 100 ohm	PJ	VR1013	J51745474	POT.	B 470k ohm	
R1162	J01225223	Carbon Film RES.	1/6W 22k ohm	PJ	VR1014	J51745471	POT.	B 470 ohm	
R1163	J02225221	Carbon Film RES.	1/6W 220 ohm	PJ					

PARTS LIST

Q1041	G1090297	IC	uPD4094BC	D1081	G2090408	Diode	1SS270
Q1042	G1090297	IC	uPD4094BC	D1082	G2060004	Diode	1SS270TJ
Q1043	G3090078	Transistor	DTA143ES	D1083	G2060004	Diode	1SS270TJ
Q1044	G3406691	Transistor	2SD669A	D1084	G2060004	Diode	1SS270TJ
Q1045	G1090837	IC	IR3M03A	D1085	G2060004	Diode	1SS270TJ
Q1046	G3090074	Transistor	BA1A4M	D1086	G2090002	Diode	10D10
Q1047	G3304580B	Transistor	2SC458B	D1087	G2060004	Diode	1SS270TJ
Q1048	G3090077	Transistor	BA1L3Z	D1088	G2090408	Diode	1SS270
Q1049	G3304580B	Transistor	2SC458B	D1089	G2090408	Diode	1SS270
				D1090	G2090340	Diode	1SS83
D1001	G2090340	Diode	1SS83	D1091	G2090408	Diode	1SS270
D1002	G2090340	Diode	1SS83	D1092	G2090408	Diode *	1SS270
D1003	G2090340	Diode	1SS83	D1093	G2060004	Diode	1SS270TJ
D1004	G2090340	Diode	1SS83	D1094	G2090408	Diode	1SS270
D1005	G2090340	Diode	1SS83	D1097	G2060004	Diode	1SS270TJ
D1006	G2090340	Diode	1SS83	D1098	G2060004	Diode	1SS270TJ
D1007	G2090340	Diode	1SS83	D1099	G2090226	Diode	HZ4C3
D1008	G2090340	Diode	1SS83	D1100	G2090408	Diode	1SS270
D1009	G2090340	Diode	1SS83	D1101	G2090408	Diode	1SS270
D1010	G2090340	Diode	1SS83				
D1011	G2090340	Diode	1SS83	TH1001	G9090010	Thermistor	112302-2
D1012	G2090340	Diode	1SS83	TH1002	G9090008	Thermistor	112102-2
D1013	G2090340	Diode	1SS83	TH1003	G9090015	Thermistor	SDT-100
D1014	G2090340	Diode	1SS83	TH1004	G9090039	Thermistor	112152-2
D1015	G2090340	Diode	1SS83				
D1016	G2090340	Diode	1SS83	XF1001	H1102090	XTAL Filter	47M15AU
D1017	G2090340	Diode	1SS83				
D1018	G2090340	Diode	1SS83	R1001	J01225471	Carbon Film RES.	1/6W 470 ohm PJ
D1019	G2060004	Diode	1SS270TJ	R1002	J01225560	Carbon Film RES.	1/6W 56 ohm PJ
D1021	G2060004	Diode	1SS270TJ	R1003	J02225102	Carbon Film RES.	1/6W 1k ohm UJ
D1022	G2060004	Diode	1SS270TJ	R1004	J01225102	Carbon Film RES.	1/6W 1k ohm PJ
D1023	G2060004	Diode	1SS270TJ	R1005	J01225102	Carbon Film RES.	1/6W 1k ohm PJ
D1024	G2090408	Diode	1SS270	R1006	J01225471	Carbon Film RES.	1/6W 470 ohm PJ
Q1025	G2090244	Diode	1SS106	R1007	J02245471	Carbon Film RES.	1/4W 470 ohm SJ
Q1026	G2090244	Diode	1SS106	R1008	J02245101	Carbon Film RES.	1/6W 100 ohm UJ
Q1027	G2090244	Diode	1SS106	R1009	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
Q1028	G2060004	Diode	1SS270TJ	R1010	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
Q1029	G2060004	Diode	1SS270TJ	R1011	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
Q1031	G2060004	Diode	1SS270TJ	R1012	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
Q1032	G2060004	Diode	1SS270TJ	R1013	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
Q1033	G2060004	Diode	1SS270TJ	R1014	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
Q1034	G2060004	Diode	1SS270TJ	R1015	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
Q1035	G2090244	Diode	1SS106	R1016	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
Q1036	G2090244	Diode	1SS106	R1017	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
Q1037	G2090244	Diode	1SS106	R1018	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
Q1038	G2090244	Diode	1SS106	R1019	J01225121	Carbon Film RES.	1/6W 120 ohm PJ
Q1039	G2090408	Diode	1SS270	R1020	J01225391	Carbon Film RES.	1/6W 390 ohm PJ
Q1040	G2090408	Diode	1SS270	R1022	J01225104	Carbon Film RES.	1/6W 100k ohm PJ
Q1041	G2090408	Diode	1SS270	R1023	J02225104	Carbon Film RES.	1/6W 100k ohm UJ
Q1042	G2060004	Diode	1SS270TJ	R1024	J01225471	Carbon Film RES.	1/6W 470 ohm PJ
Q1044	G2090408	Diode	1SS270	R1025	J01225471	Carbon Film RES.	1/6W 470 ohm PJ
Q1045	G2060004	Diode	1SS270TJ	R1027	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
Q1046	G2060004	Diode	1SS270TJ	R1030	J01225393	Carbon Film RES.	1/6W 39k ohm PJ
Q1047	G2060004	Diode	1SS270TJ	R1031	J01225683	Carbon Film RES.	1/6W 68k ohm PJ
Q1048	G2060004	Diode	1SS270TJ	R1032	J01225104	Carbon Film RES.	1/6W 100k ohm PJ
Q1049	G2060004	Diode	1SS270TJ	R1033	J01225684	Carbon Film RES.	1/6W 680k ohm PJ
Q1050	G2060004	Diode	1SS270TJ	R1034	J01225272	Carbon Film RES.	1/6W 2.7k ohm PJ
Q1051	G2060004	Diode	1SS270TJ	R1035	J01225153	Carbon Film RES.	1/6W 15k ohm PJ
D1052	G2090408	Diode	1SS270	R1036	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
D1053	G2090408	Diode	1SS270	R1037	J01225471	Carbon Film RES.	1/6W 470 ohm PJ
D1054	G2090408	Diode	1SS270	R1038	J01225560	Carbon Film RES.	1/6W 56 ohm PJ
D1055	G2090135	Diode	ND487C2-3R	R1039	J01225101	Carbon Film RES.	1/6W 100 ohm PJ
D1056	G2090340	Diode	1SS83	R1042	J01225682	Carbon Film RES.	1/6W 6.8k ohm PJ
D1057	G2090340	Diode	1SS83	R1043	J01225472	Carbon Film RES.	1/6W 4.7k ohm PJ
D1058	G9090007	Diode	MV12	R1044	J01225331	Carbon Film RES.	1/6W 330 ohm PJ
D1059	G2090229	Diode	HZ7B1	R1045	J02225331	Carbon Film RES.	1/6W 330 ohm UJ
D1060	G2090229	Diode	HZ7B1	R1046	J02225104	Carbon Film RES.	1/6W 100k ohm UJ
D1061	G2060004	Diode	1SS270TJ	R1047	J02225681	Carbon Film RES.	1/6W 680 ohm UJ
D1062	G2060004	Diode	1SS270TJ	R1048	J02225184	Carbon Film RES.	1/6W 180k ohm UJ
D1063	G2060004	Diode	1SS270TJ	R1049	J01225471	Carbon Film RES.	1/6W 470 ohm PJ
D1064	G2090408	Diode	1SS270	R1050	J01225151	Carbon Film RES.	1/6W 150 ohm PJ
D1065	G2060004	Diode	1SS270TJ	R1051	J02225101	Carbon Film RES.	1/6W 100 ohm UJ
D1066	G2090408	Diode	1SS270	R1052	J01225153	Carbon Film RES.	1/6W 15k ohm PJ
D1067	G2090118	Diode	1SS97	R1053	J02225273	Carbon Film RES.	1/6W 27k ohm UJ
D1068	G2060004	Diode	1SS270TJ	R1054	J02225103	Carbon Film RES.	1/6W 10k ohm UJ
D1069	G2090408	Diode	1SS270	R1055	J02225471	Carbon Film RES.	1/6W 470 ohm UJ
D1070	G2060004	Diode	1SS270TJ	R1056	J01225151	Carbon Film RES.	1/6W 150 ohm PJ
D1071	G2060004	Diode	1SS270TJ	R1057	J02225101	Carbon Film RES.	1/6W 100 ohm UJ
D1072	G2090408	Diode	1SS270	R1058	J01225153	Carbon Film RES.	1/6W 15k ohm PJ
D1073	G2090408	Diode	1SS270	R1060	J01225393	Carbon Film RES.	1/6W 39k ohm PJ
D1074	G2090408	Diode	1SS270	R1061	J01225103	Carbon Film RES.	1/6W 10k ohm PJ
D1075	G2090408	Diode *	1SS270	R1062	J01225221	Carbon Film RES.	1/6W 220 ohm PJ
D1076	G2090408	Diode *	1SS270	R1063	J01225221	Carbon Film RES.	1/6W 220 ohm PJ
D1077	G2090408	Diode	1SS270	R1064	J02225101	Carbon Film RES.	1/6W 100 ohm UJ
D1078	G2090408	Diode	1SS270	R1065	J01225153	Carbon Film RES.	1/6W 15k ohm PJ
D1079	G2090408	Diode	1SS270	R1066	J01225333	Carbon Film RES.	1/6W 33k ohm PJ
D1080	G2060004	Diode	1SS270TJ	R1067	J01225683	Carbon Film RES.	1/6W 68k ohm PJ

*: Version F

PARTS LIST

MAIN CHASSIS

Symbol No.	Part No.	Description	Device
Q1	G1090778	IC	L7809
Q2	G1090294	IC	uPC7808H
VR1	J6280097	Potentiometer	10KA/10kB (AF/SQL)
VR2	J6280098	Potentiometer	10kB/10kB(MIC/DRIVE)
C1	K19149025	Ceramic CAP.	50WV 0.1uF
C2	K13179009	Ceramic CAP. ▲	50WV 0.047uF
C3	K10176102	Ceramic CAP.	B 50WV 0.001uF
C4	K13179008	Ceramic CAP.	F 50WV 0.01uF
C5	K19149025	Ceramic CAP.	50WV 0.1uF
L1	L9190010	Ferrite Beads	
L2	L9190047	Ferrite Beads	
SP1	M4090030	Speaker	1.5W 8 ohm
J1	P1090194	Connector (ANT)	
J2	P0090158	Connector (MIC)	
J3	P0090026	Connector (13.8V DC)	
	Q9000078	Terminal	
	Q9000192	Sarcon	
	Q9000125	Insulator	
	T9205617	Wire ASSY	P1-P2
	T9205618	Wire ASSY	P3-P4
	T9315504	Wire ASSY	P5-P6
	T9205619	Wire ASSY ▲	P7
	T9205620	Wire ASSY	P8
	T9205621	Wire ASSY	P9
	T9205622	Wire ASSY	P10
	T9205623A	Wire ASSY	P11
	T9205624A	Wire ASSY	P12
	T9205625	Wire ASSY	P13
	T9311301B	Wire ASSY	P14
	T9317811	Wire ASSY	P15
	T9317825	Wire ASSY	
	R3510940A	Panel	
	R3123790	Filter	
	R3123800	Knob (MAIN)	
	R3123830	Knob (AF, MIC)	
	R6123840	Knob (SQL, DRIVE)	
	R3123850A	Knob (CLAR)	
	R3123870A	Knob (D LOCK)	
	R3123890	Knob (MODE)	
	R3123910	Knob (VFO MR)	
	R3123930	Knob (VFO M)	
	R3123950	Knob (M VFO)	
	R3123960	Knob (SPLIT)	
	R3123980	Knob (PRIM)	
	R3123990	Knob (FAST)	
	R3124020A	Knob (POWER)	
	R3124030B	Knob (NAR)	
	R3124040A	Knob (ATT)	
	R3124050A	Knob (NB, MOX)	
	R3124190	Ring	
	R3804450A	Case Top	
	R3804460A	Case Bottom	
	R5510950A	Side Trim	
	R0510960	Heatsink Cover	
	R0510970A	Heatsink Cover	
	R4804670A	Heatsink	
	R0124060	Fitting	
	R3124010	Knob	
	R5510951	Side Trim	
	R3124800		
	R7049015	SP Net	
	R3100700	Foot	
	R0100690A	Stand	
	R7125160	Sponge	
	R7125170	Sponge	
	R7125230	Press Board	
	R7125430	Sponge	
	R7125450	Sponge	
	R7125460	Sponge	
	R7125630	Sponge	
	R6125640A	Washer	
	R8013580	Name Plate	
	R0116420	Ground Lug	
	R7125830	Sheet	

R7125850	Press Board	
R0125890	Fitting	
R7125900	Sponge	
R0126000	Clamp	
R7125631	Sponge Rubber	
R3126040	Rubber Foot	
R7126140	Plate	
R7126150	Plate	
R6100980A	Nut	
R7126400	Plate	
R7126410	Fiber	
R7126640	Sheet	
R8124070	Nameplate "FT-747SX" •	
R8124090	Nameplate "FT-747GX" ▲	
R0124080A	Motor Holder	
R3056970B	Radial Fan	
M2190004	Motor MDN-7R1	DC13.5V
T9205619	Wire ASSY	

MAIN UNIT

Symbol No.	Part No.	Description	Device
	F2942000A	Printed Circuit Board	
	C029420AA	PCB with Components (10W: Version F)	
	C029420AB	PCB with Components (100W: Version F)	
	C029420AC	PCB with Components	
	C029420AD	PCB with Components w/o NB UNIT (10W: Version F)	
	C029420AE	PCB with Components w/o NB UNIT (100W: Version F)	
	C029420AF	PCB with Components w/o NB UNIT	
Q1001	G3801250	FET	2SK125
Q1002	G3801250	FET	2SK125
Q1003	G4800740L	FET	3SK74L
Q1004	G3802410Y	FET	2SK241Y
Q1005	G4800740L	FET	3SK74L
Q1006	G4800740L	FET	3SK74L
Q1007	G4800740L	FET	3SK74L
Q1008	G3304580B	Transistor	2SC458B
Q1009	G3304580B	Transistor	2SC458B
Q1010	G3801040J	FET	2SK104J
Q1011	G3801921G	FET	2SK192AGR
Q1012	G3107331P	Transistor	2SA733AP
Q1013	G3090074	Transistor	BA1A4M
Q1014	G1090633	IC	M5218P
Q1015	G3304580B	Transistor	2SC458B
Q1016	G3304580B	Transistor	2SC458B
Q1017	G3090077	Transistor	BA1L3Z
Q1018	G3304580B	Transistor	2SC458B
Q1019	G3304580B	Transistor	2SC458B
Q1020	G3090074	Transistor	BA1A4M
Q1021	G3304580B	Transistor	2SC458B
Q1022	G1090101	IC	uPC1037H
Q1023	G4800740L	FET	3SK74L
Q1024	G3802410Y	FET	2SK241Y
Q1025	G3802410Y	FET	2SK241Y
Q1026	G3305350B	Transistor	2SC535B
Q1027	G3801250	FET	2SK125
Q1028	G3304580B	Transistor	2SC458B
Q1029	G3090074	Transistor	BA1A4M
Q1030	G3090074	Transistor	BA1A4M
Q1031	G3090078	Transistor	DTA143ES
Q1032	G3320530	Transistor	2SC2053
Q1033	G3090074	Transistor	BA1A4M
Q1034	G1090633	IC	M5218P
Q1035	G3304584B	Transistor	2SC458BTZ
Q1036	G1090749	IC	M5223P
Q1037	G3090074	Transistor	BA1A4M
Q1038	G1090721	IC	M54563P
Q1039	G1090657	IC	uPD4028BC
Q1040	G1090836	IC	M54564P

• 10W Type
▲ 100W Type

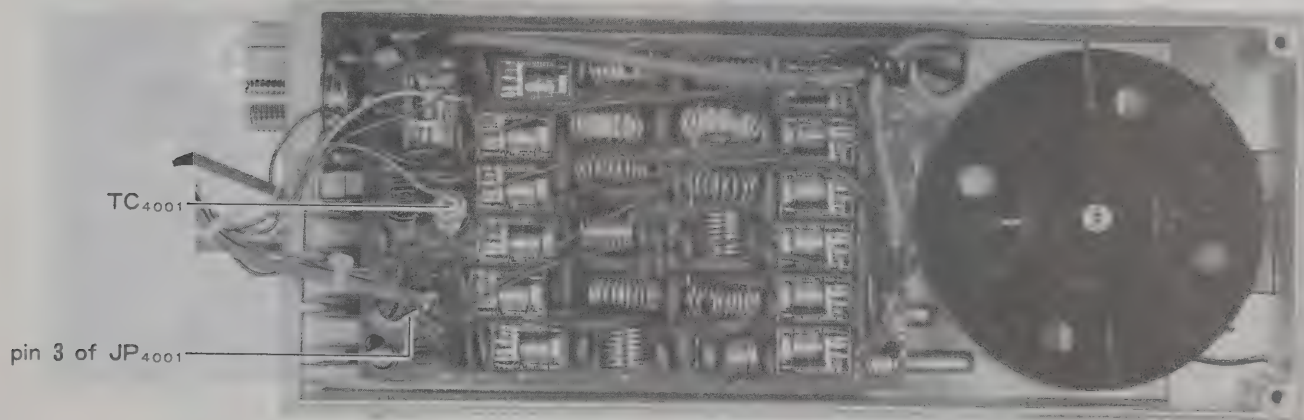
ALIGNMENT

VI. LPF Unit (CM Coupler Balance)

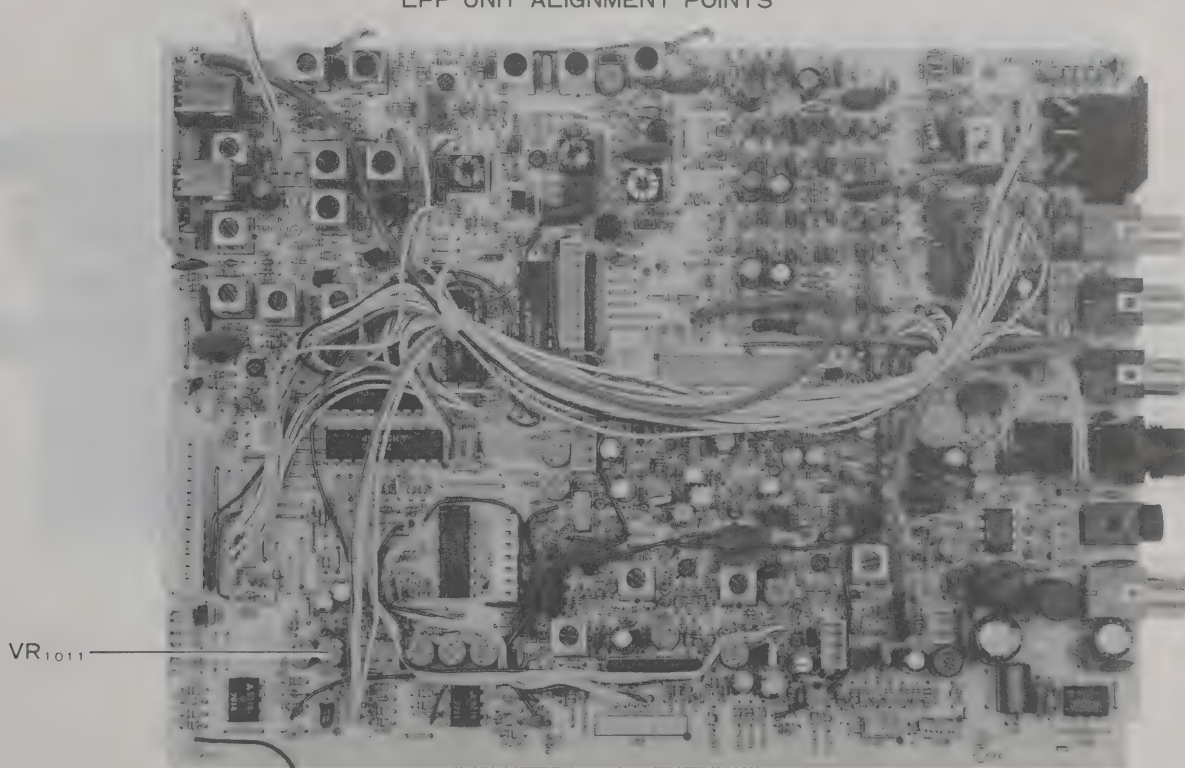
1. Connect the dummy load to the antenna jack, and the DC voltmeter between pin 3 of JP4001 and chassis ground.
2. Tune to 14.2000 MHz, CW mode, and set the DRIVE control fully clockwise.
3. Press the MOX button and adjust TC4001 for minimum deflection on the voltmeter.
4. Press the MOX button again to return to receive, and remove the test equipment.

VII. Main Unit (AFP - Automatic Final Protection)

1. Connect the wattmeter and 16.7-ohm dummy load (three 50-ohm loads in parallel) to the antenna jack.
2. With the transceiver tuned to 14.2000 MHz, CW mode, set the DRIVE control fully clockwise.
3. Press the MOX button and adjust VR1011 for 75W output.
4. Press the MOX button again to return to receive, and disconnect the test equipment.



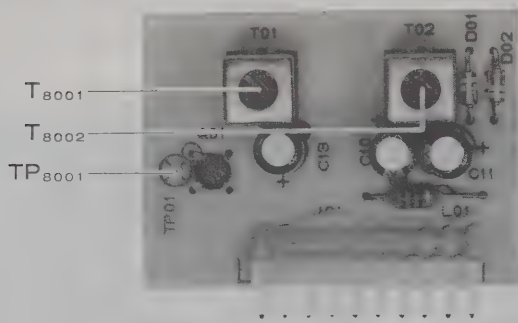
LPF UNIT ALIGNMENT POINTS



MAIN UNIT ALIGNMENT POINT
(AFP Section)

IV. Noise Blanker Unit

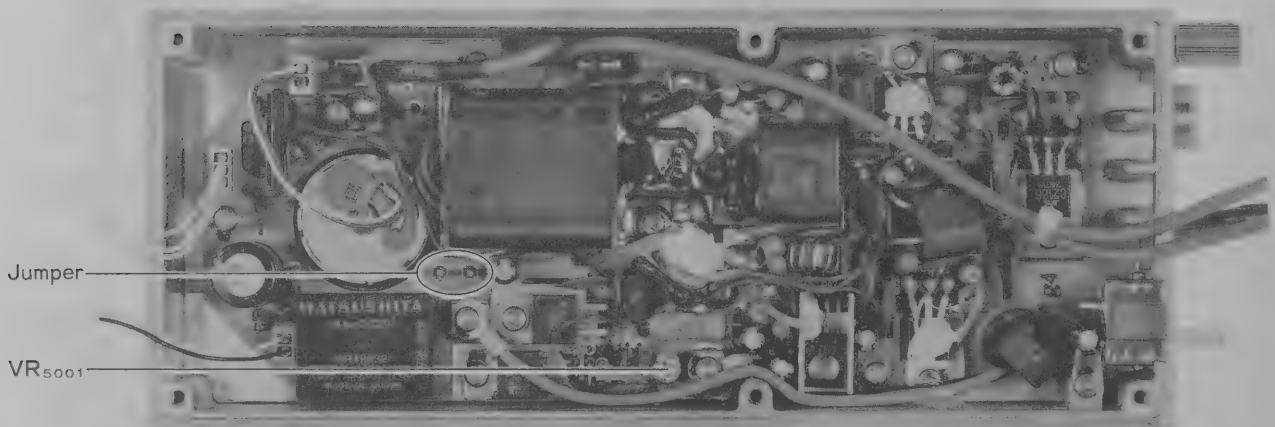
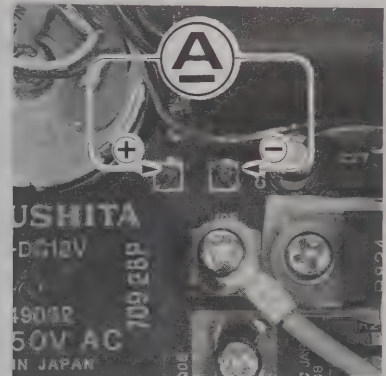
1. Connect the RF generator to the antenna jack, and the DC voltmeter between TP8001 and chassis ground.
2. Tune the transceiver and RF generator to 14.2000 MHz, and inject 40 dBu with no modulation.
3. Press the NB switch and select the USB mode.
4. Adjust T8001 and T8002 for minimum deflection on the voltmeter.
5. Disconnect the test equipment.



NB UNIT ALIGNMENT POINTS

V. 100W PA Unit (Idling Current)

1. Temporarily remove the jumper indicated below, and connect the DC milliammeter (set to 500 mA range) in its place.
2. Set the transceiver to USB mode, and set the MIC gain fully counterclockwise.
3. Press the MOX button and adjust VR5001 for 200 ± 50 mA on the milliammeter.
4. Press the MOX button again to return to receive, remove the milliammeter and reinstall the jumper.



100W PA UNIT ALIGNMENT POINTS

ALIGNMENT

III. Main Unit, Transmitter

A. TX IF

1. Connect the dummy load and wattmeter to the antenna jack, and tune to 14.2000 MHz, CW mode.
2. Press the MOX button and set the DRIVE control for 50W output.
3. Adjust T1014-T1019 for peak on the wattmeter, reducing the DRIVE, if necessary, to keep power below 60W output.
4. Press the MOX button again to return to receive.

B. ALC & PO Meter Sensitivity

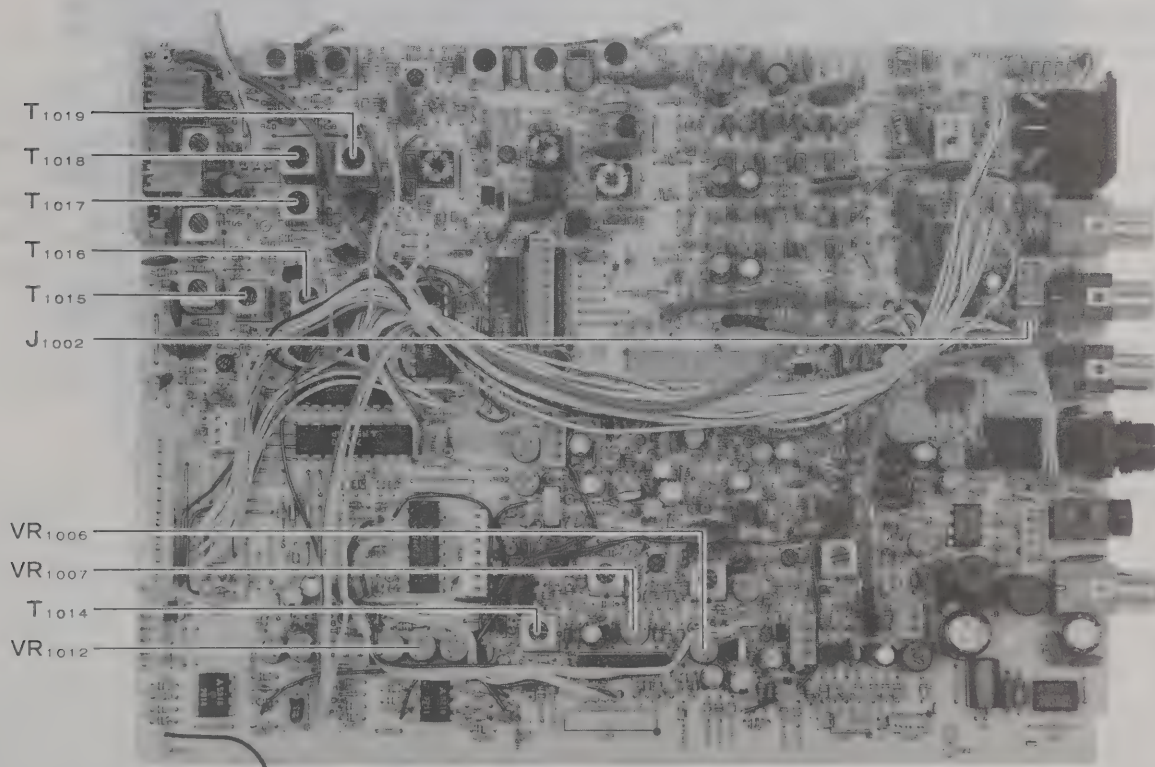
1. With the dummy load and wattmeter connected to the antenna jack, and tuned to 14.2000 MHz, CW mode, set the DRIVE control fully clockwise.
2. Press the MOX button and adjust VR1010 for 100W output, and then VR1012 for S-meter deflection to "8" on the PO scale, repeating both adjustments alternately several times.

C. SSB Carrier Balance

1. With the dummy load and wattmeter connected to the antenna jack, and tuned to 14.2000 MHz, CW mode, set the MIC gain fully counterclockwise.
2. Connect the RF voltmeter to J1002.
3. Press the MOX button and adjust VR1007 for minimum on the voltmeter.
4. Press the MOX button again to return to receive, and disconnect the voltmeter.

D. AM Carrier Level

1. With the dummy load and wattmeter connected to the antenna jack, and tuned to 14.2000 MHz, AM mode, set the MIC gain fully counterclockwise.
2. Preset VR1006 fully clockwise.
3. Press the MOX button and set the DRIVE control for 80W output.
4. Adjust VR1006 for 20W output.
5. Press the MOX button again to return to receive, and remove the test equipment.



MAIN UNIT ALIGNMENT POINTS
(Transmitter Section)

C. RX IF, Part II

1. Set the transceiver to 14.2000 MHz (USB).
2. Tune the RF generator for a 1.5 kHz heterodyne in the receiver, and adjust the injection level for S-7 on the S-meter.
3. Adjust T1003-T1013 for maximum on the S-meter, reducing the injection level, if necessary, to keep S-meter deflection near S-7.
4. Reduce the injection level to +6dBu and adjust VR1001 for S-1 indication.
5. Perform the next procedure.

D. S-Meter Sensitivity, Part II

Perform the preceding procedure, if not done already.

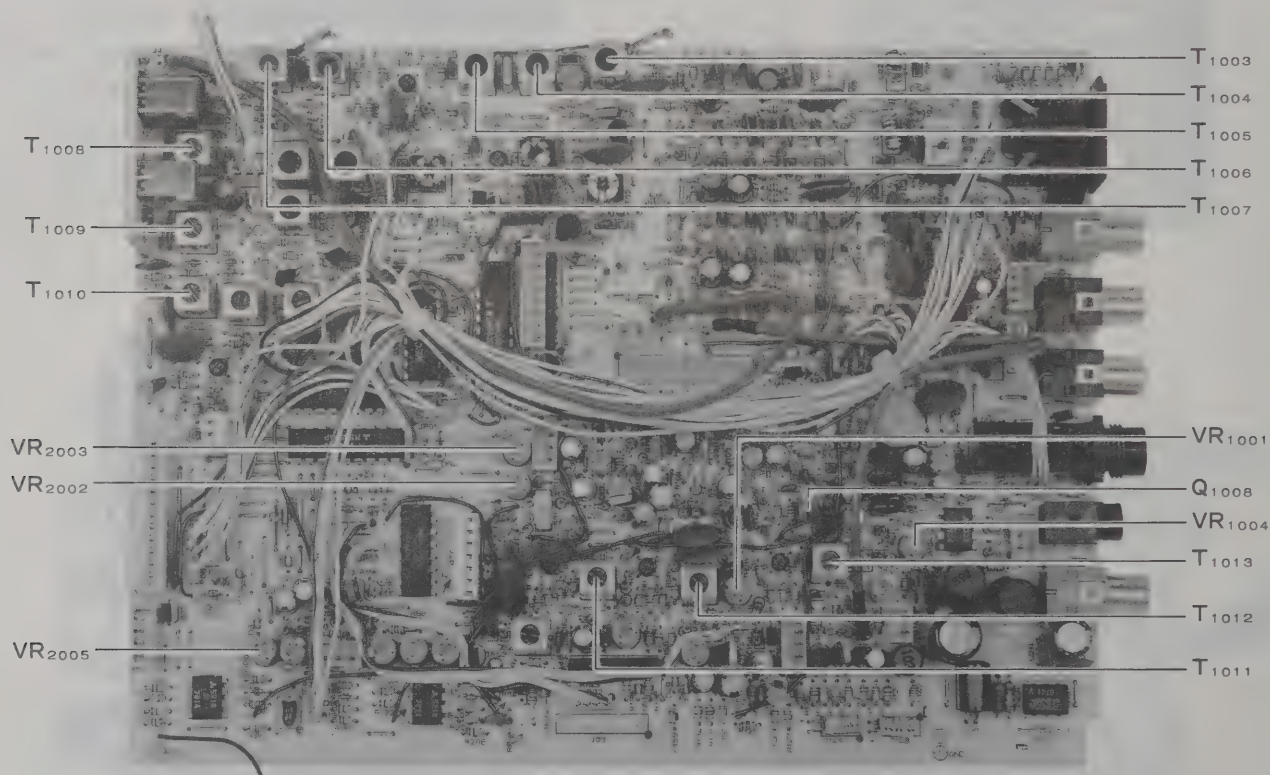
1. Set the RF injection level to +100 dBu and adjust VR1003 for S-meter deflection of 60 dB over S-9.
2. Disconnect the test equipment.

E. RX 1st Mixer

1. In LSB mode, tune to the internal heterodyne near 7.1 MHz.
2. Adjust VR1004 for best null of the heterodyne.

F. Noise Squelch

1. Tune to 14.2000 MHz, USB mode, and set the SQL control to the 10 o'clock position.
2. Adjust VR1005 so the squelch just closes when no signal is received.



MAIN UNIT ALIGNMENT POINTS
(Receiver Section)

ALIGNMENT

<u>Adjust.</u> <u>Frequency</u>	<u>Adjust.</u> <u>Transformer</u>	<u>Check</u> <u>Freq.</u>	<u>Check</u> <u>Voltage</u>
2.5000	T2006	2.4999 7.4999 0.1000	4.5-6.5V 5.0-6.5V 1.5-3.0V
7.5000	T2007	14.4999	5.0-6.5V
14.5000	T2008	21.4999	5.0-6.5V
21.5000	T2009	29.9999	5.0-6.5V

3. Connect the RF voltmeter to pin 13 of Q2024 and tune the transceiver to 29.9999 MHz. Confirm at least 90mVrms on the RF voltmeter.
4. Disconnect the voltmeters.

E. Reference Oscillator

1. Connect the frequency counter to the exposed lead of C2030 (TP2002).
2. Tune the transceiver to 7.0000 MHz, LSB mode.
3. If the TCXO option is installed, adjust the trimmer accessible through the hole in the TCXO housing, if necessary, for 5.7635 MHz ± 3 Hz on the counter.
4. If the TCXO option is not installed, adjust TC2004, if necessary, for 5.7635 MHz ± 10 Hz on the counter.
5. Remove the counter.

F. Carrier Point

1. Disconnect TMP plug P2001 from J1017 on the Main Unit, and connect the frequency counter to P2001.
2. With the LSB mode selected, adjust TC2003 for 8.2135 MHz ± 10 Hz on the counter.
3. Select USB mode and adjust TC2002 for 8.2165 MHz ± 10 Hz on the counter.
4. Select CW mode and set the DRIVE control fully counterclockwise (minimum).
5. Press the MOX button to transmit, and adjust TC2001 for 8.2158 MHz ± 10 Hz on the counter.
6. Press the MOX button again to return to receive, remove the counter and reconnect P2001 to J1017 (unless performing the next procedure).

G. Carrier Level

1. Disconnect TMP plug P2001 from J1017 on the Main Unit, and connect a 50-ohm resistor in parallel with the RF voltmeter to P2001.
2. Confirm at least 230 mVrms on the RF voltmeter in all modes.
3. Remove the voltmeter and resistor, and reconnect P2001 to J1017.

II. Main Unit - Receiver

A. RX IF, Part I

1. Connect the RF generator to the antenna jack, and the AF voltmeter and an 8-ohm, 3W resistor across the EXT SPKR jack.
2. Tune the transceiver to 14.2000 MHz, USB mode. Set the AF gain to the 10 o'clock position.
3. Tune the RF generator for a 1.5 kHz heterodyne in the receiver, and adjust the injection level for S-7 on the S-meter.
4. Adjust T1003-T1013 for peak on the AF voltmeter, reducing the injection level, if necessary, to keep S-meter deflection near S-7.
5. Leave the test equipment connected for the next three procedures.

B. S-meter Sensitivity, Part I

1. Connect the RF voltmeter to the emitter of Q1008.
2. Tune the transceiver to 14.0000 MHz, USB mode, and adjust VR1004 for minimum on the voltmeter.
3. Adjust VR1002 so that the S-meter just begins to deflect.
4. Disconnect the voltmeter, and continue with the next procedure.

I. Local Unit

A. 2nd Local Overall Check

1. Disconnect TMP plug P2002 from J1022 on the Main Unit.
2. Connect the frequency counter to P2002 and confirm 38.8380 MHz ± 400 Hz on the counter.
3. Remove the counter and connect a 50-ohm resistor and the RF voltmeter to P2002.
4. Confirm at least 230 mVrms on the voltmeter.
5. Disconnect the resistor and voltmeter, and replace P2002 in J1022.

B. PLL Subloop VCO

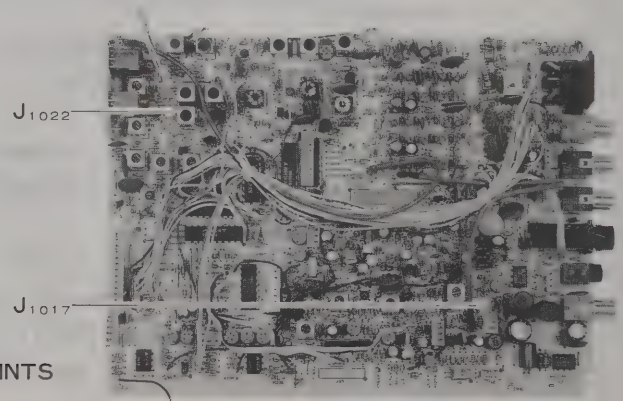
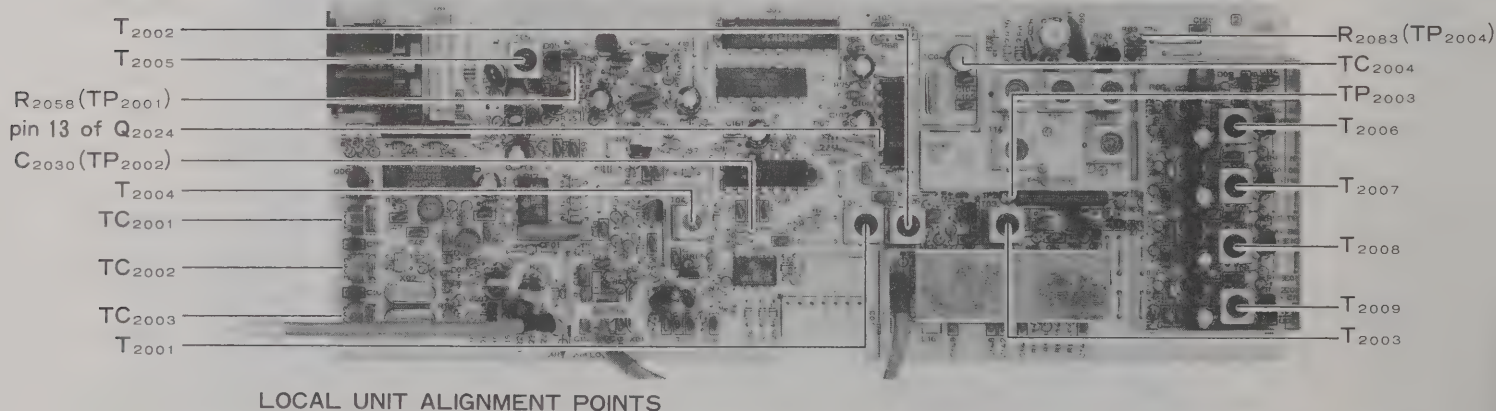
1. Connect the DC voltmeter between the exposed lead of R2058 (TP2001) and chassis ground.
2. Tune the transceiver to 7.0015 MHz, LSB mode.
3. Adjust T2005 for $2.0 \pm 0.1V$ on the meter.
4. Retune the transceiver to 7.0014 MHz and confirm at least $5.6 \pm 0.6V$ on the voltmeter.
5. Disconnect the voltmeter.

C. PLL Subloop BPF

1. Connect the RF voltmeter to the exposed lead of C2030 (TP2002).
2. Tune the transceiver to 7.0265 MHz, LSB mode.
3. Adjust T2004 for peak on the voltmeter (at least 70 mVrms).
4. Move the voltmeter to TP2003, and retune the transceiver to 7.0267 MHz.
5. Adjust T2001-T2003 for peak on the voltmeter (more than 50 mVrms).
6. Disconnect the voltmeter.

D. PLL Main Loop VCO

1. Connect the DC voltmeter between the exposed lead of R2083 (TP2004) and chassis ground.
2. Referring to the following table, tune the transceiver to each adjustment frequency (MHz), adjust the corresponding transformer for $1.5 \pm 0.1V$, retune to the corresponding check frequency and confirm the check voltage on the voltmeter.



ALIGNMENT

Alignment Equipment

Frequency counter with accuracy of 0.1 ppm to 100 MHz

DC voltmeter with at least 10-Megohm input impedance

RF voltmeter with at least 5% accuracy to 100 MHz, high impedance, and ranging from 10 mV to 3 Vrms

AF millivoltmeter

DC milliammeter ranging to 500 mA

RF in-line wattmeter

Resistive dummy load, 50 ohms, 150W; three required for SWR Turndown alignment

RF signal generator covering 1-30 MHz, with calibrated output levels from 5 dB μ to 100 dB μ

AF signal generator with calibrated output levels from 1 mV to 25 mV

RF sampling coupler ("T")

Additional Alignment Precautions

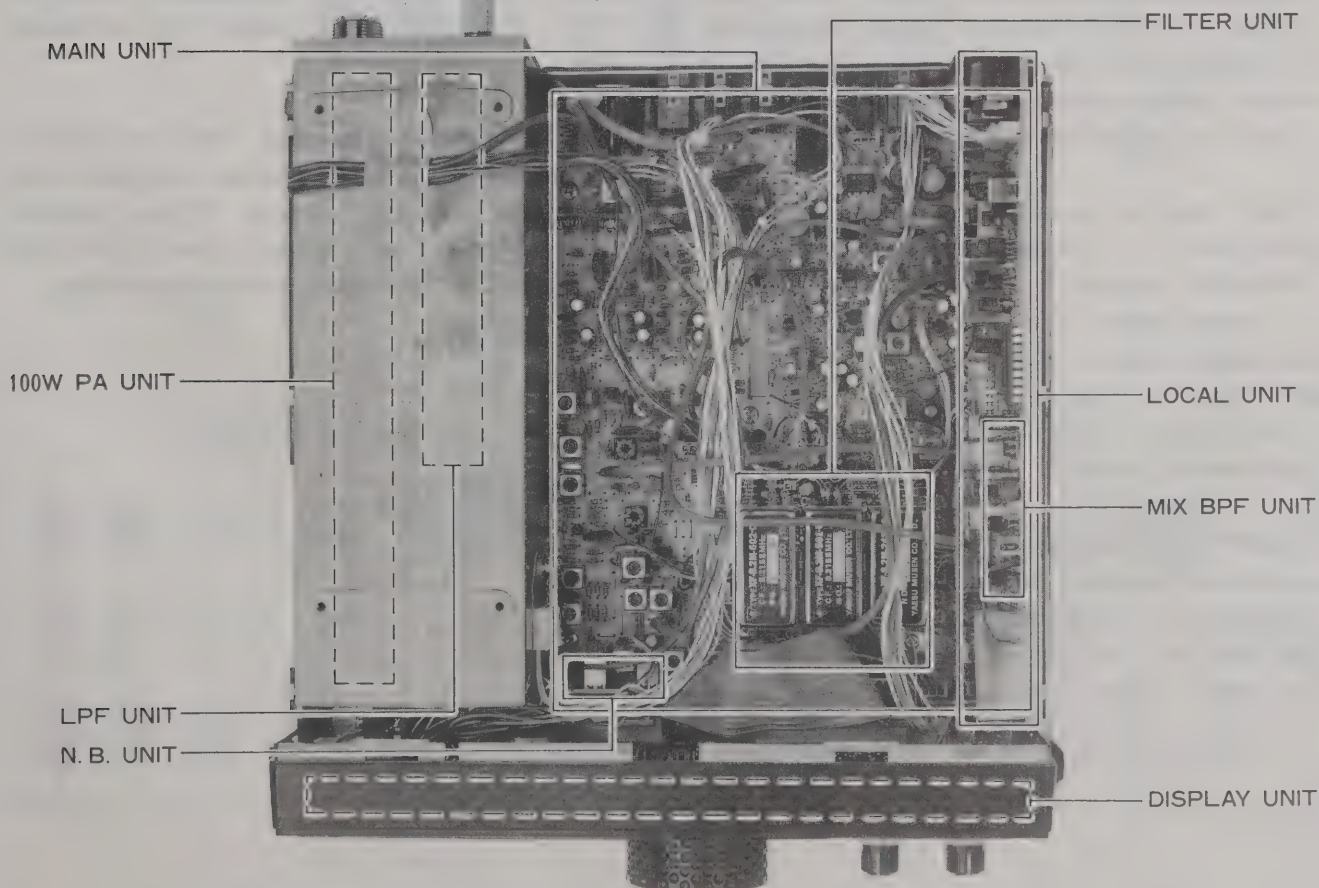
Correct alignment requires that the ambient temperature be the same as that of the transceiver and test equipment, and that this temperature be held constant between 20 and 30 °C (68 to 86 °F). When the transceiver is brought into the shop from hot or cold air it should be allowed some time for thermal equalization before alignment.

Alignments must only be made with oscillator shields and circuit boards firmly affixed in place. Also, the test equipment must be thoroughly warmed up before beginning.

Alignment values assume a DC supply voltage of 13.5V DC.

Note: Signal levels in dB referred to in the alignment procedure are based on 0dBu=0.5uV.

BOARD LAYOUT



The FT-747GX is carefully designed to allow the knowledgeable operator to make all adjustments required for various station conditions, modes and operator preferences simply from the controls on the front panel, without opening the case of the transceiver. These adjustments are described in the FT-747GX Operating Manual.

The following procedures cover the sometimes critical and tedious adjustments that are not normally required once the transceiver has left the factory. However, if damage occurs and some parts subsequently be replaced, realignment may be required. If a sudden problem occurs during normal operation, it is likely due to component failure; realignment should not be done until after the faulty component has been replaced.

We recommend servicing be performed only by authorized Yaesu service technicians who are experienced with the circuitry and fully equipped for repair and alignment. Therefore, if a fault is suspected, contact the dealer from whom the transceiver was purchased for instructions regarding repair. Authorized Yaesu service technicians realign all circuits and make complete performance checks to ensure compliance with factory specifications after replacing any faulty components.

Those who do undertake any alignment are cautioned to proceed at their own risk. Problems caused by unauthorized attempts at realignment are not covered by the warranty policy. Also, Yaesu must reserve the right to change circuits and alignment procedures in the interest of improved performance, without notifying owners.

Under no circumstances should alignment be attempted unless the normal function and operation of the transceiver are clearly understood, the cause of the malfunction has been clearly pinpointed and any faulty

components replaced, and the need for realignment determined to be absolutely necessary.

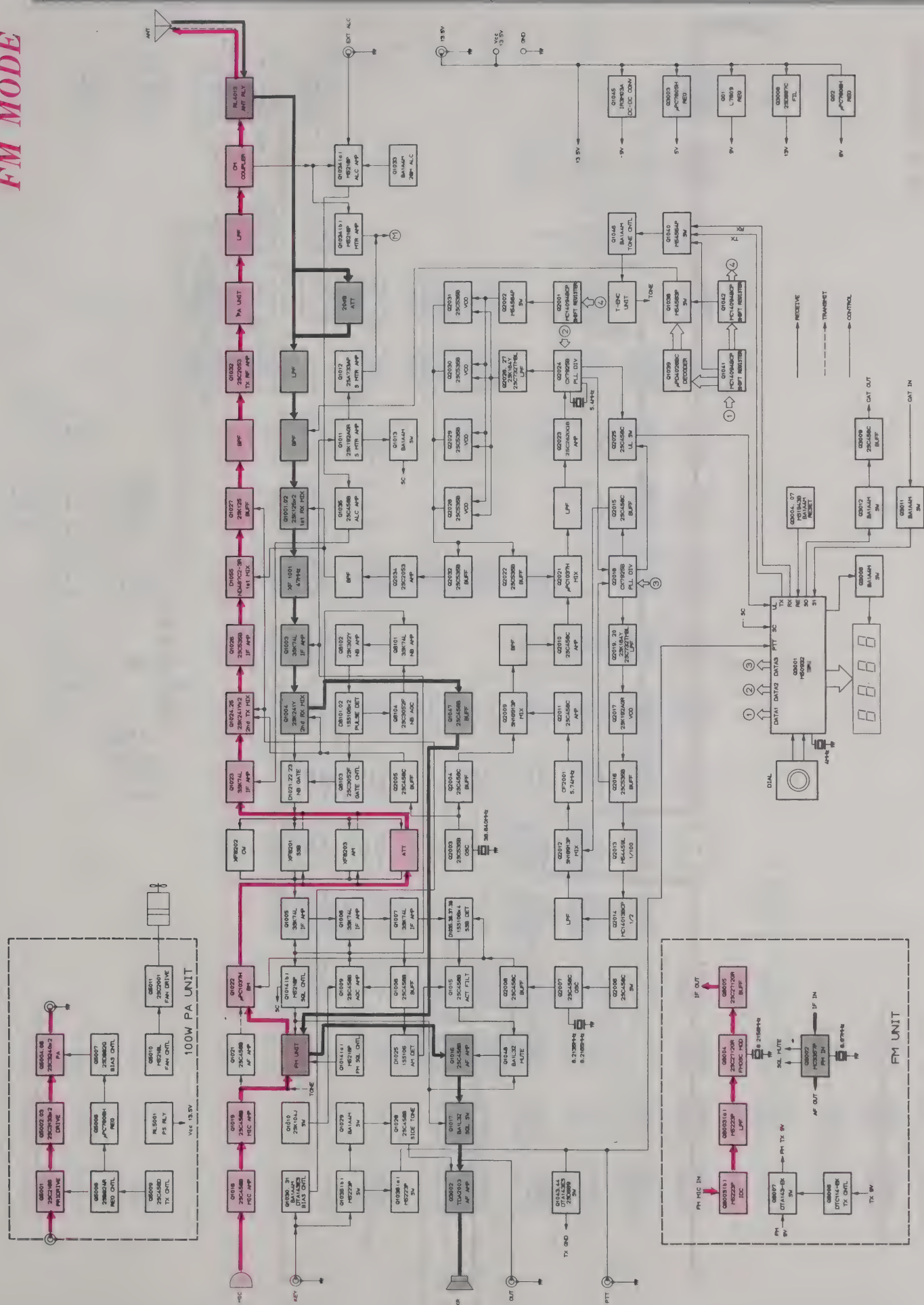
The following test equipment (and thorough familiarity with its correct use) is necessary for complete realignment. Correction of problems caused by misalignment resulting from use of improper test equipment is not covered under the warranty policy. While most steps do not require all equipment listed, interactions of some adjustments may require complex adjustments be performed afterwards. Do not attempt to perform only a single step unless it is clearly isolated electrically from all other steps. Rather, have all test equipment ready before beginning, and follow all of the steps in a section in the order they are presented.

A 50-ohm dummy load must be connected to the antenna jack in steps calling for transmission (pressing the MOX button). Correct alignment is not possible with an antenna.

The NAR, ATT and NB buttons should be set to OFF and the SQL control must be fully counterclockwise, unless stated otherwise.

After completing one step, read the following step to determine whether the same test equipment will be required. If not, remove the test equipment (except dummy load and wattmeter, if connected) before proceeding.

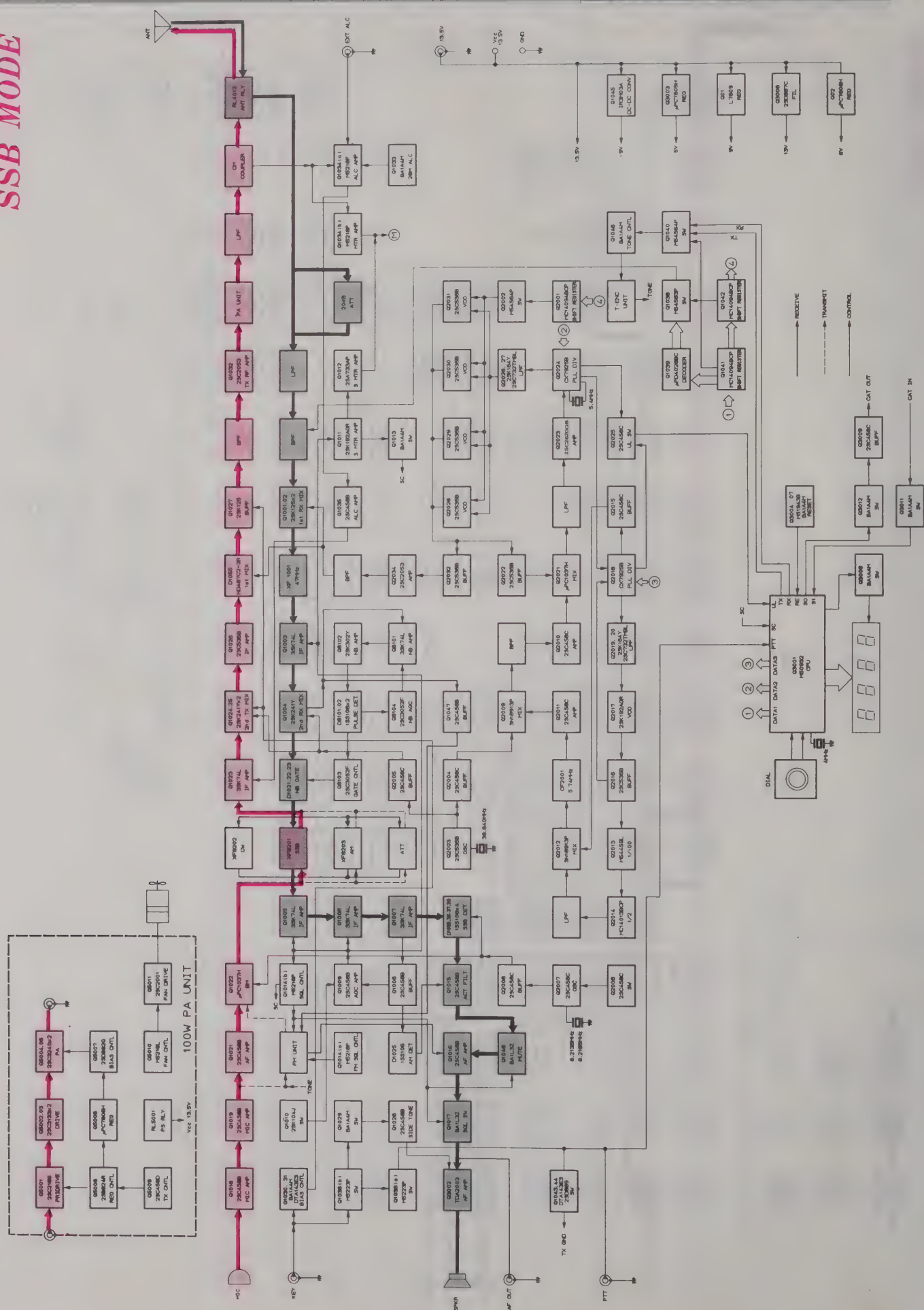
FM MODE



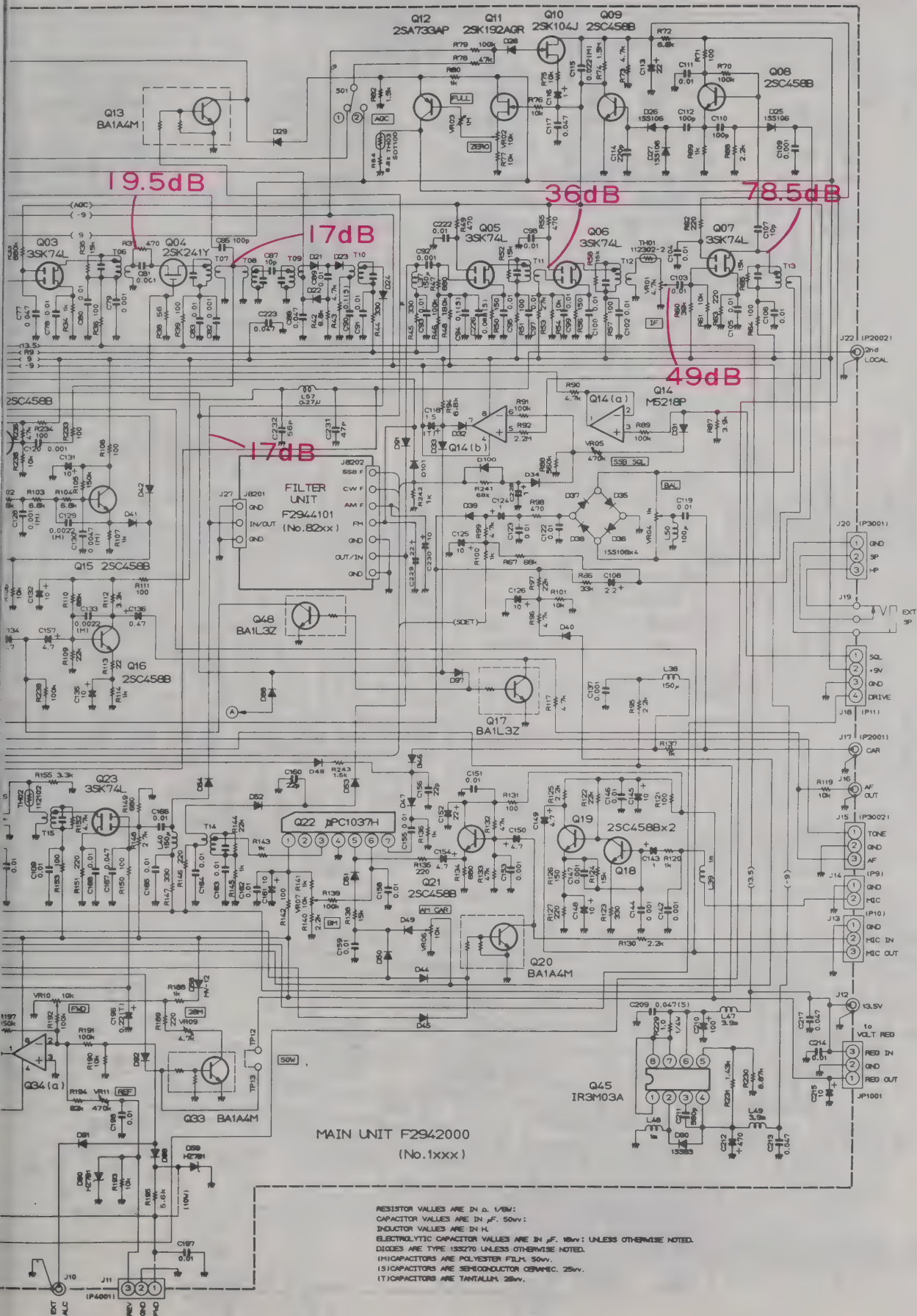


SIGNAL PATH



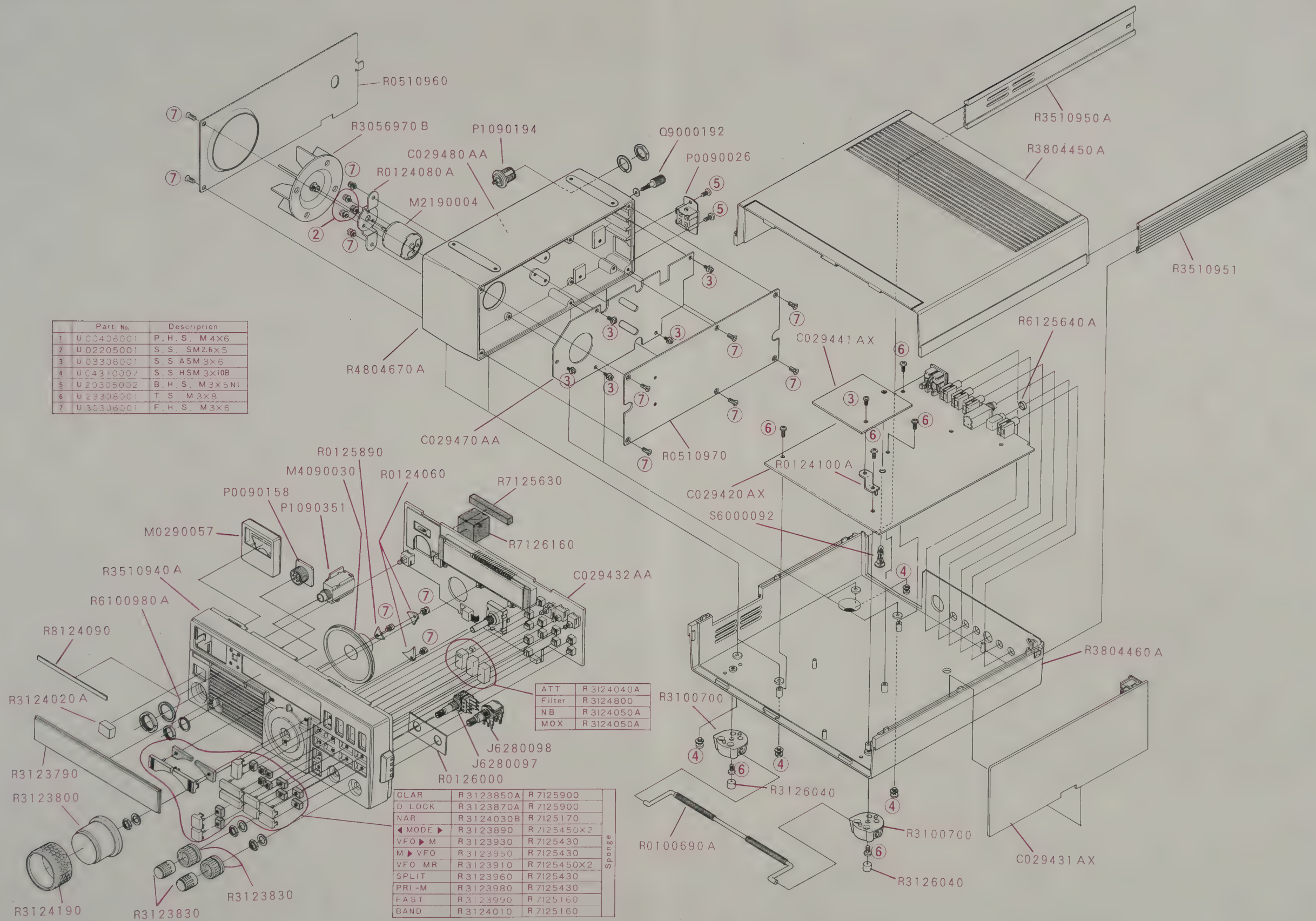




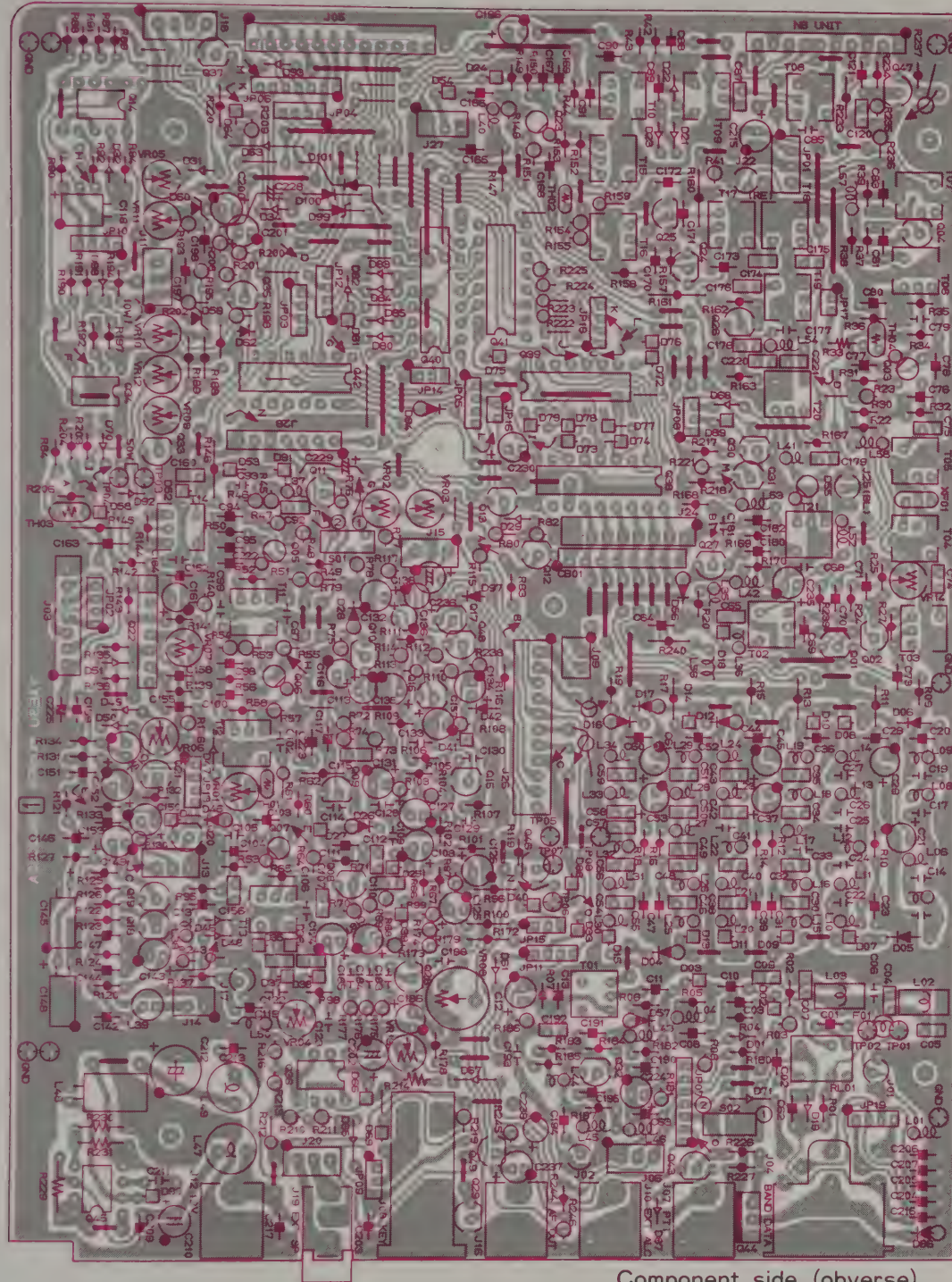




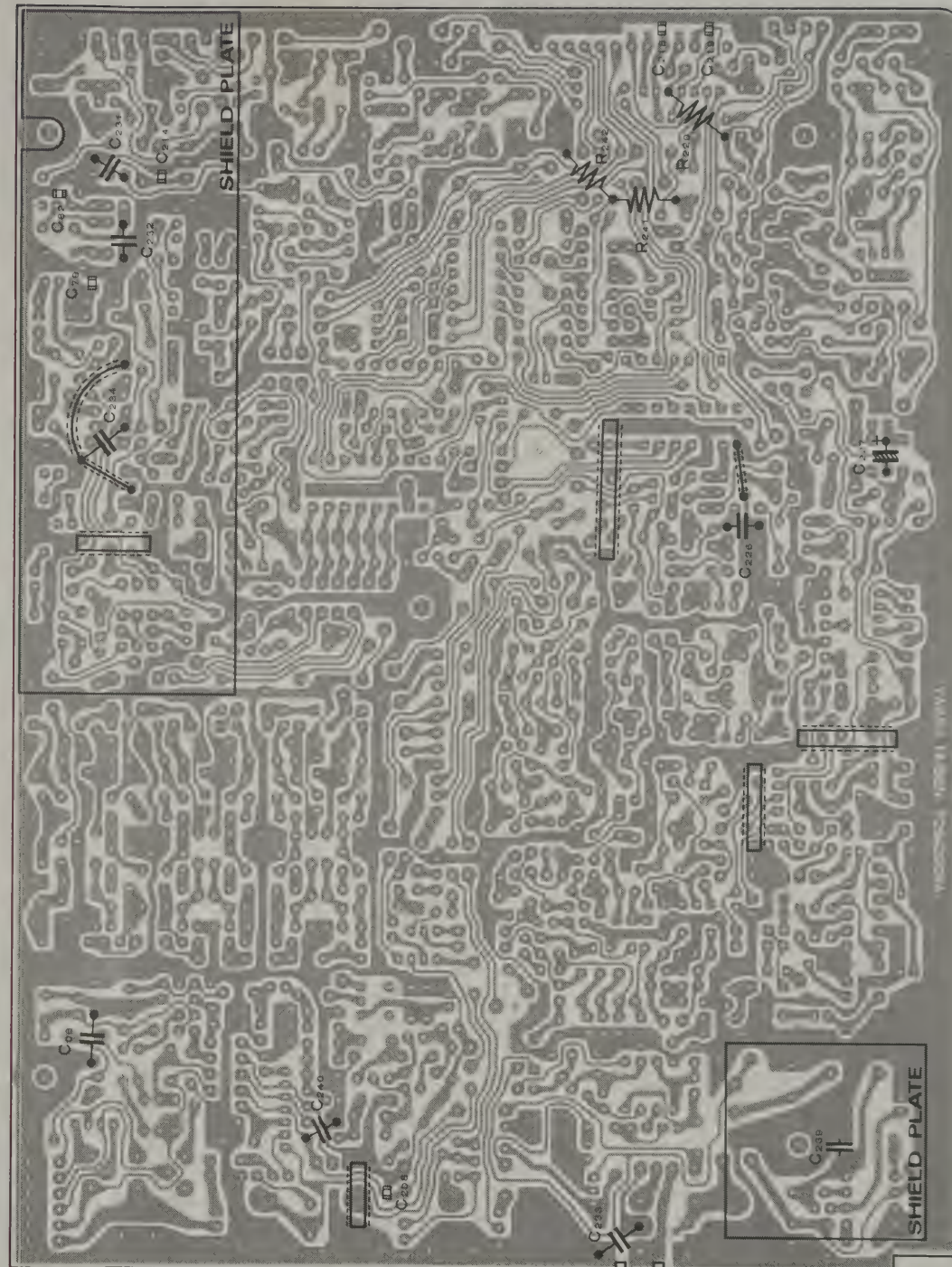
EXPLODED VIEW



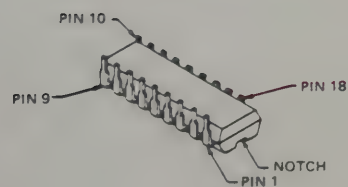
PARTS LAYOUT



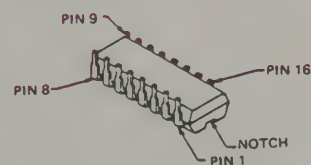
Component side (obverse)



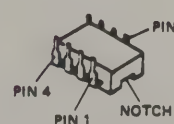
Solder side (obverse)



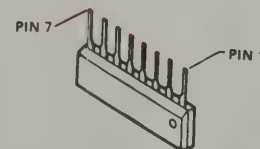
M54563P (Q1038)
M54564P (Q1040)



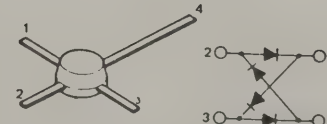
μ PD4028BC (Q1039)
 μ PD4094BC (Q1041,1042)



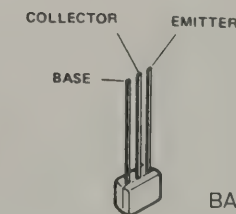
IR3M03A (Q1045)
M5218P (Q1014,1034)
M5223P (Q1036)



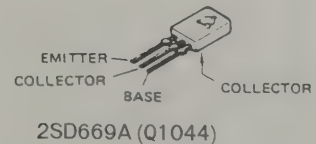
μ PC1037H (Q1022)



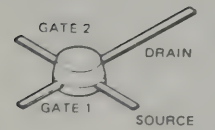
ND487C2-3R (D1055)



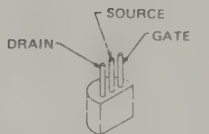
BA1A4M (Q1013,1020,1029,1030,
1033,1037,1046)
BA1L3Z (Q1017,1048)
DTA143ES (Q1031,1043)



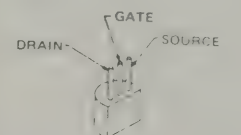
2SD669A (Q1044)



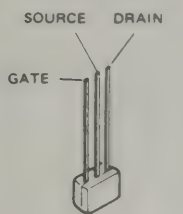
3SK74L (Q1003,
1005~1007,
1023)



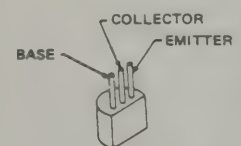
2SK104J (Q1010)



2SK125 (Q1001,1002,
1027)



2SK192AGR (Q1011)
2SK241GR (Q1004,1024,
1025)



2SA733AP (Q1012)
2SC458B (Q1008,1009,
1015,1016,
1018,1019,
1021,1028,
1047,1049)

2SC458BTZ (Q1035)
2SC535B (Q1026)
2SC2053 (Q1032)

MAIN UNIT VOLTAGE CHART

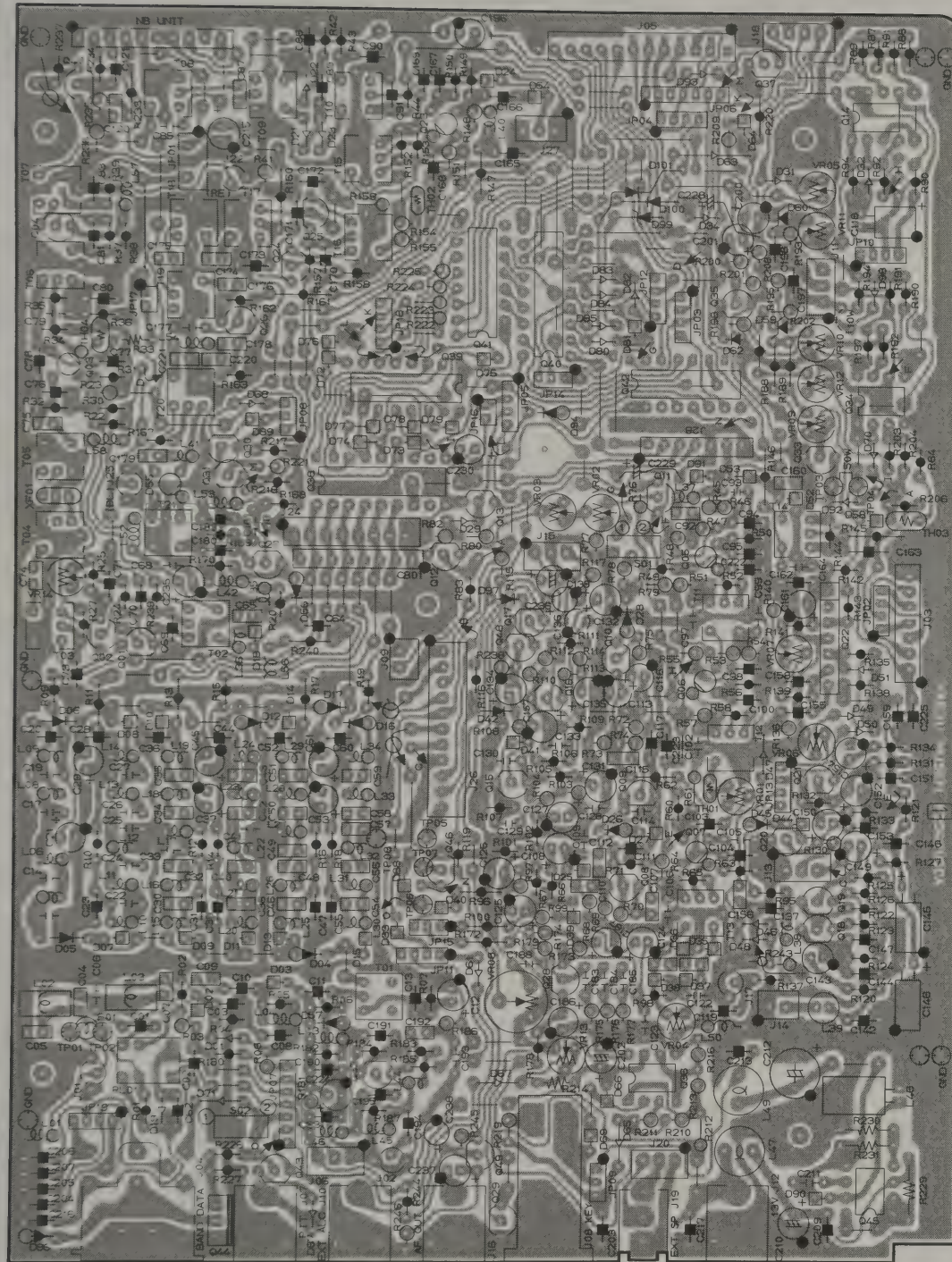
(DC VOLT)

	E (S)	C (D)	B (G ₁)	(G ₂)	REMARKS
Q1001	2.5/-0.1	12.7/13.4	-0.7/-5.1		RX/TX
Q1002	2.5/-0.1	12.7/13.4	-0.7/-5.1		RX/TX
Q1003	2.0/0	13.2/13.4	1.5/-4.1	3.2/3.2	RX/TX
Q1004	0.6	13.4	0		
Q1005	1.7/0	7.8/8.8	1.7/-4.0	3.4/3.4	RX/TX
Q1006	2.2	7.4	2.4	3.4	
Q1007	1.9	8.0	1.8	3.6	
Q1008	4.8	8.3	5.5		
Q1009	0	3.4	0.1		
Q1010	3.6	3.6	0		
Q1011	6.2	8.8	3.4		
Q1012	5.3/0.7	0/0	4.7/4.6		RX/TX
Q1013	0/0	5.0/0.1	0/4.3		RX/TX
Q1015	4.2	8.4	4.8		
Q1016	1.3	4.4	2.0		
Q1017	0/0	0/0	0.1/3.7		RX/TX
Q1018	0.1	1.4	0.7		
Q1019	0.8	4.2	1.4		
Q1020	0/0	0/0	7.0/0		RX/TX
Q1021	3.0	8.4	3.6		
Q1023	1.9	0	1.8	3.2	
Q1024	0/0.6	8.9/8.6	-3.9/0.1		RX/TX
Q1025	0/0.6	8.9/8.6	-3.9/0.1		RX/TX
Q1026	3.0	7.5	3.8		
Q1027	0/1.6	-4.0/0.1	0/6.9		RX/TX
Q1028	0.6(0.3/0.6)	7.7(7.7/3.7)	1.0(1.0/0.9)		RX CW(TX CW KEY UP/DWN)
Q1029	0(0/0)	0.6(0.6/0)	0(0/11.0)		RX CW(TX CW KEY UP/DWN)
Q1030	0(0/0)	0(7.5/0)	0(0/10.5)		RX CW(TX CW KEY UP/DWN)
Q1031	0(7.5/7.5)	0(-0.5/7.5)	0(7.5/0)		RX CW(TX CW KEY UP/DWN)
Q1032	8.1	13.2	8.8		
Q1033	0	6.9	0		
Q1035	0	3.1	-0.5		
Q1037	0/0	0.5/7.4	4.0/0		0.5~1.5, 14.5~18.5 / other 21.5~25.0MHz
Q1043	5.5/5.0	0/5.0	5.0/0.6		RX/TX
Q1044	0/0	0.6/0	0/0.6		RX/TX
Q1046	0/0	0.4/0	0/4.8		RX/TX (MODE FM SPLIT ON)
Q1047	0.8	8.7	1.5		
Q1048	0/0	0/0	0.1/3.7		RX/TX

MAIN UNIT IC VOLTAGE CHART

(DC VOLT)

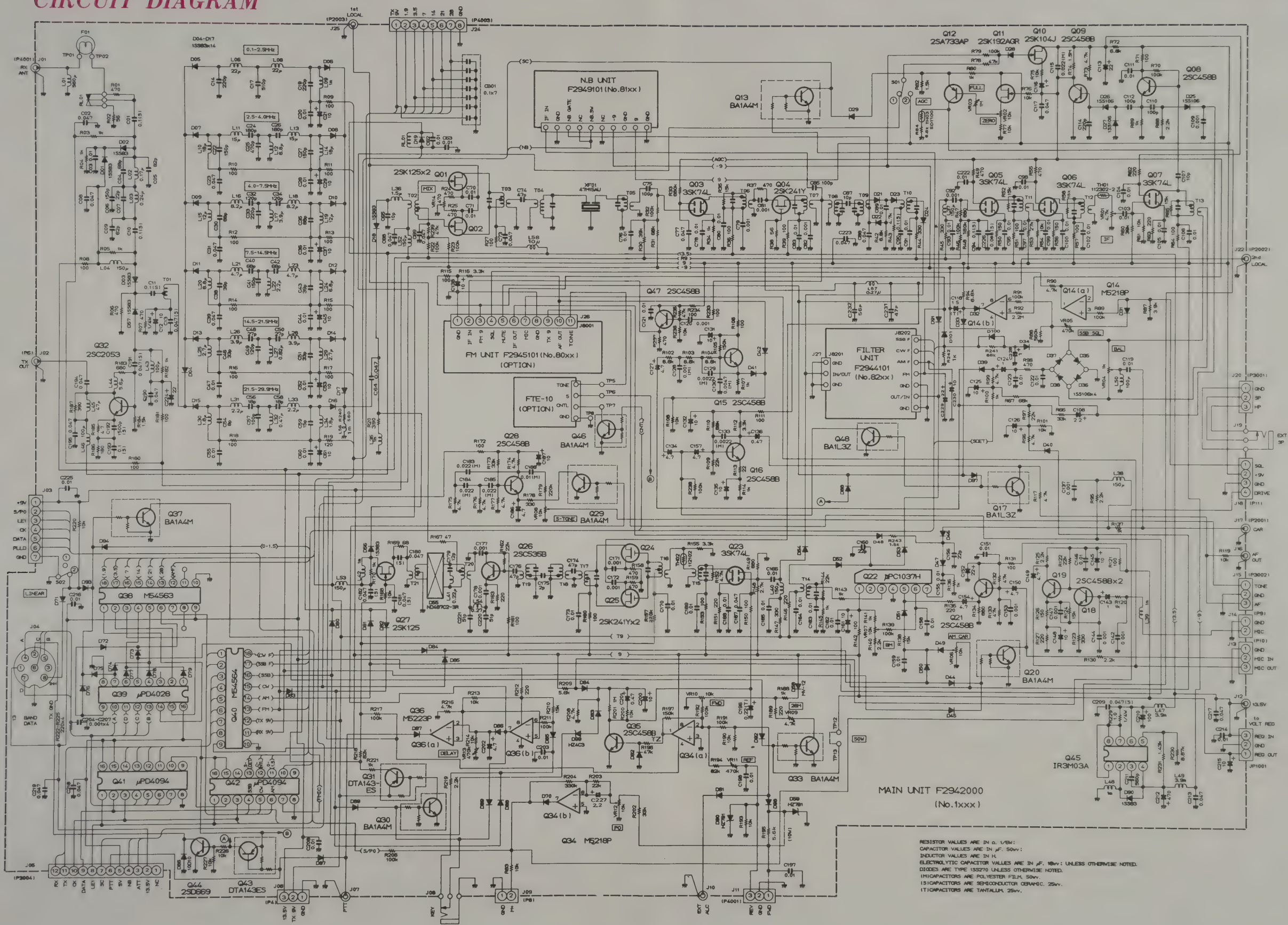
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	REMARKS
Q1014	8.4/2.5	8.4/2.5	8.8/2.5	-9.0/9.0	3.1/2.7	7.0/1.8	-7.6/8.4	8.9/8.9											SQL VR CCW/CW
Q1022	7.0	—	5.4	0	3.1	3.1	3.1												
Q1034	-5.2	0	0	-9.0	0	0	-7.7	8.9											
Q1036	12.0/0.7	0/10.2	4.2/3.9	0/0	4.2/3.9	12.9/2.1	0/10.8	13.1/12.3											KEY UP/DWN /MODE CW VR13 MIN
Q1038	0	0	0	4.1	0.2	0.2	0	0.1	13.4	0	0.2	13.0	0	0	12.0	0	0	0	MODE AM, 14MHz
Q1039	0	0	0	0	0	4.7	0	0	0	5.0	0	5.0	0	0	0	5.0			MODE AM, 14MHz
Q1040	0/0	4.8/4.8	0/0	0/0	0/0	0/0	0/4.4	4.5/0	8.9/8.9	0/0	7.6/-1.3	0/7.5	0/0	0/0	0/0	7.7/7.7	7.9/7.9	0/0	MODE USB, RX/TX
Q1041	0	4.6	0	5.0	0	5.0	0	0	0	0	0	0	0	4.8	5.0	5.0			14MHz
Q1042	0	0	0	4.8	0	0	0	0	0	0	0	0	4.9	5.0	5.0	5.0			MODE USB, 14MHz
Q1045	13.5	0.1	-8.2	-9.0	-7.8	13.5	13.5	13.5											



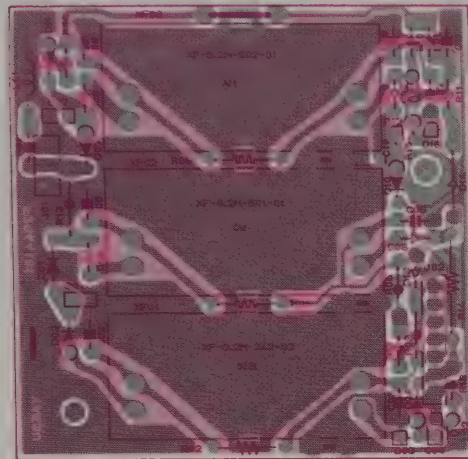
Component side (reverse)

MAIN UNIT

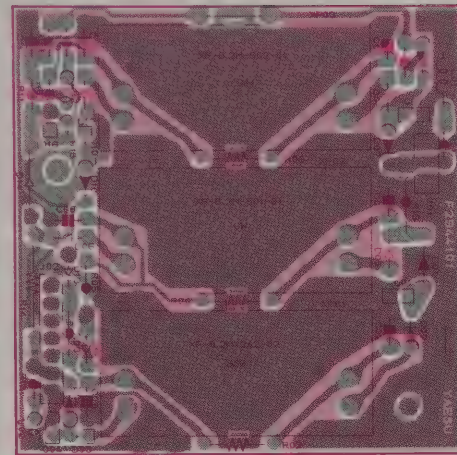
CIRCUIT DIAGRAM



FILTER UNIT PARTS LAYOUT

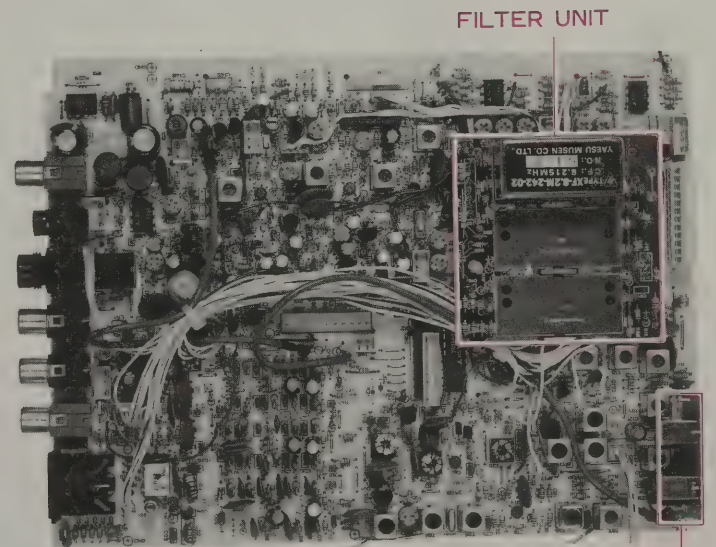
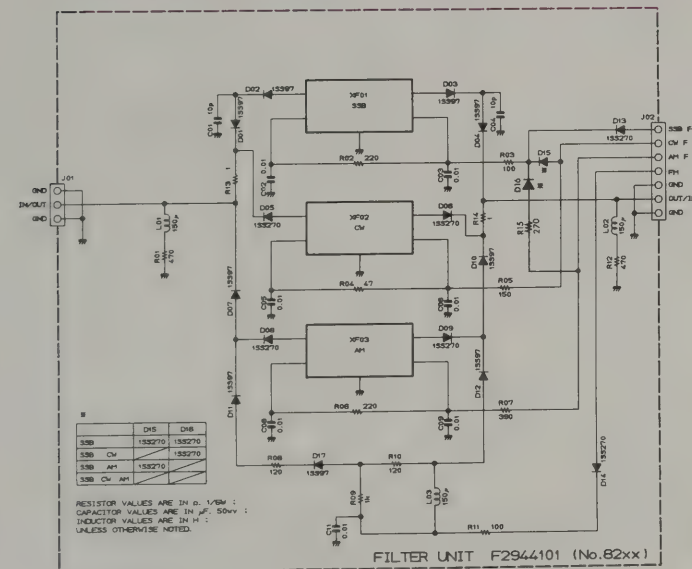


Component side (obverse)

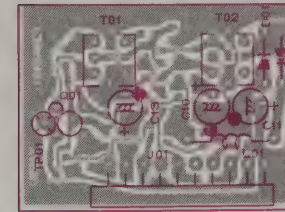


Component side (reverse)

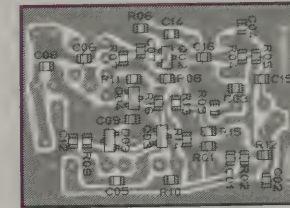
FILTER UNIT CIRCUIT DIAGRAM



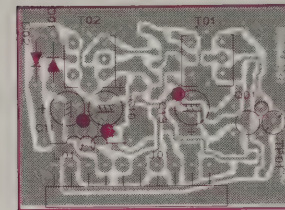
NB UNIT PARTS LAYOUT



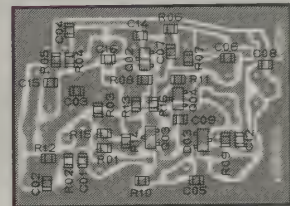
Component side (obverse)



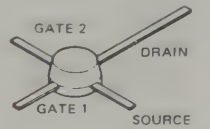
Solder side (obverse)



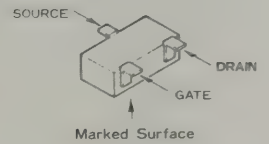
Component side (reverse)



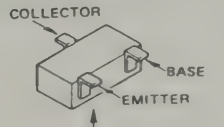
Solder side (reverse)



3SK74L
(Q8101)

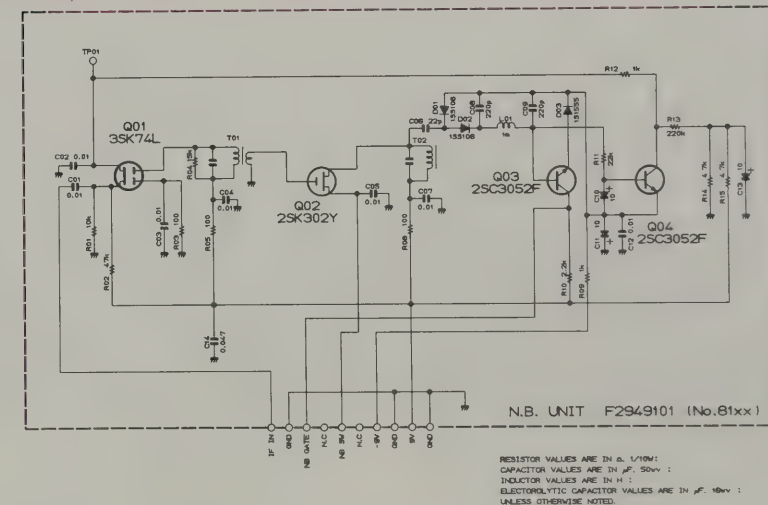


2SK302Y
(Q8102)



2SC3052F
(Q8103, Q8104)

NB UNIT CIRCUIT DIAGRAM



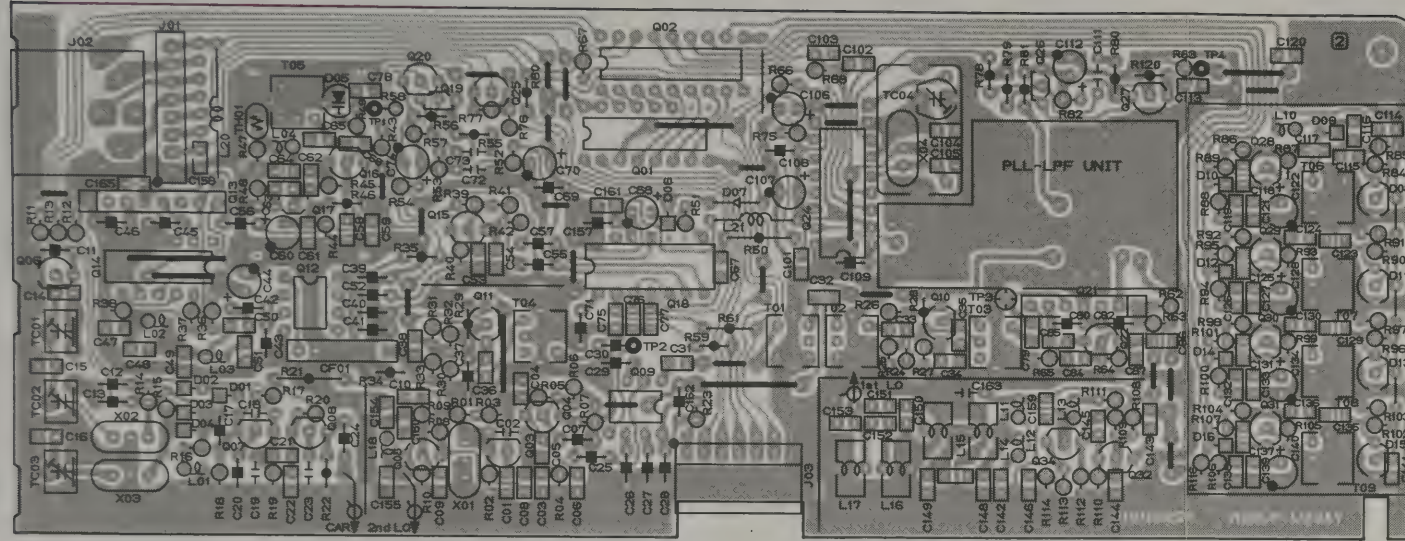
NB UNIT VOLTAGE CHART

(DC VOLT)

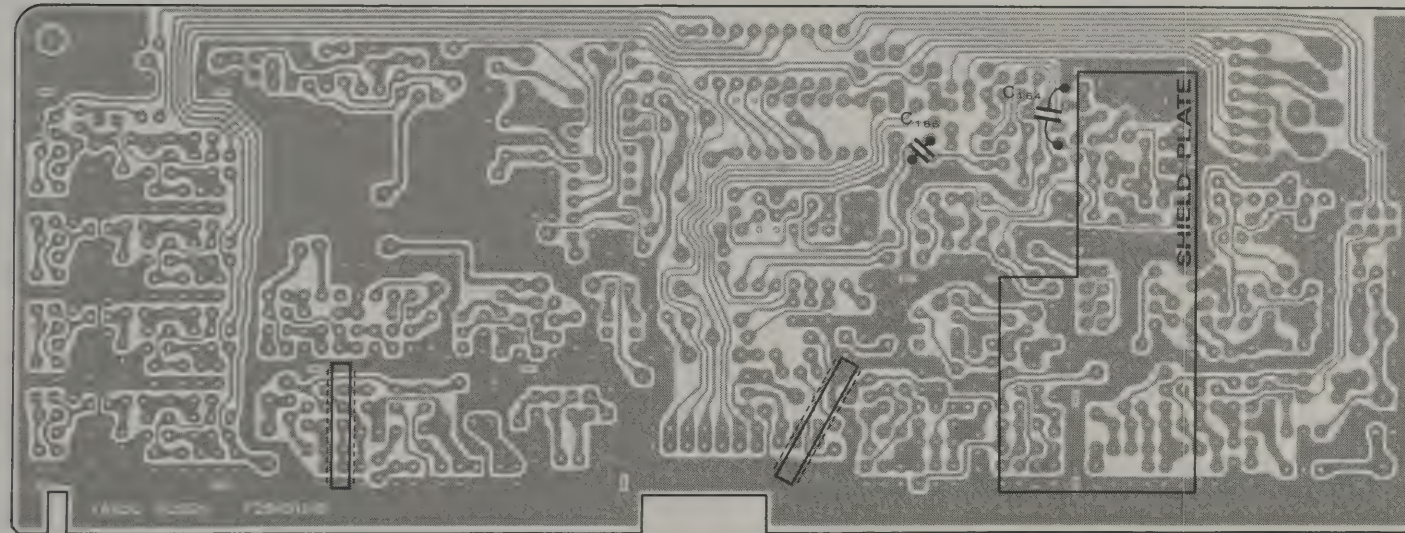
	E (S)	C (D)	B (G ₁)	(G ₂)	REMARKS
Q8101	7.4	1.5	1.5	4.3	
Q8102	1.7/0	8.9/8.2	0/0		NB OFF/ON
Q8103	-8.8	6.4	-8.9		
Q8104	-9.1	4.3	-9.0		

LOCAL UNIT

PARTS LAYOUT



Component side (obverse)



Solder side (obverse)

LOCAL UNIT IC VOLTAGE CHART

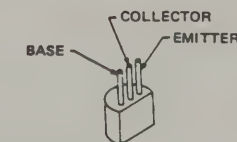
(DC VOLT)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	REMARKS
Q2001	—	—	—	0	4.8	0	0	0	0	0	0	4.8	0	0	5.0	5.0			14MHz
Q2002	0	0	4.8	0	0	4.8	0	0	8.8	0	0	0	7.6	0	0	7.6	-0.4	0	14MHz, MODE USB
Q2009	6.4	3.8	2.7	0	2.7	3.8	3.8	7.8											14MHz, MODE USB
Q2012	6.4	3.8	2.7	0	2.7	3.8	3.8	7.7											14MHz, MODE USB
Q2013	0	0	4.9	2.6	2.6	0	4.9	2.5											14MHz, MODE USB
Q2014	0	4.9	0	0	0	0	0	0	2.5	0	2.5	2.5	2.3	4.9					14MHz, MODE USB
Q2018	-2.4	—	—	—	2.1	2.2	0.5	0	—	—	2.4	5.0	4.2	0					14MHz, MODE USB
Q2021	5.9	5.2	4.8	0	2.6	2.6	2.6												14MHz, MODE USB
Q2024	-2.4	—	—	—	2.2	1.9	0.5	0	—	—	0.5	4.8	2.0	0					14MHz, MODE USB

LOCAL UNIT VOLTAGE CHART

(DC VOLT)

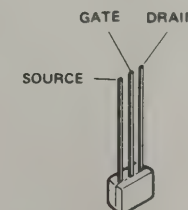
	E (S)	C (D)	B (G)	REMARKS
Q2003	3.1	8.1	3.9	
Q2004	3.5	8.1	4.2	
Q2005	1.4	8.1	2.2	
Q2006	0/0	0.7/0	0/0.7	RX/TX, MODE CW
Q2007	2.0	6.6	2.0	MODE USB
Q2008	1.7	8.0	2.4	MODE USB
Q2010	1.8	8.4	2.5	
Q2011	1.9	8.4	2.6	
Q2015	3.6	8.0	4.2	
Q2016	2.3	8.3	2.9	
Q2017	1.0	8.4	0	
Q2019	8.6	0.5	0.6	
Q2020	0	5.6	0.7	
Q2022	2.5	8.3	3.2	
Q2025	0/0	5.0/0	0/0.6	PLL LOCK/UNLOCK
Q2026	0.8	8.6	0.5	14MHz
Q2027	0.1	5.3	0.8	14MHz
Q2028	2.6	7.1	3.3	3.5MHz
Q2029	2.6	7.1	3.3	28MHz
Q2030	2.6	7.1	3.3	18MHz
Q2031	3.1	7.0	3.9	28MHz
Q2032	2.5	8.3	3.3	
Q2034	2.8	8.7	3.5	



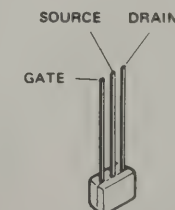
2SC458C (Q2004~2008,
2010,2011,
2015,2025)

2SC535B (Q2003,2016,
2022,2028-
2032)

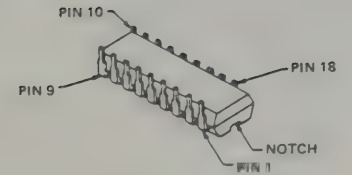
2SC732TMBL (Q2020,2027)
2SC2053 (Q2034)



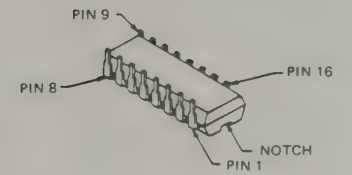
2SK184Y (Q2019,2026)



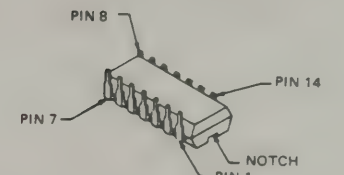
2SK192AGR (Q2017)



M54564P (Q2002)

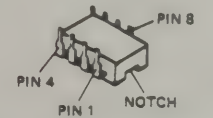


μPD4094BC (Q2001)

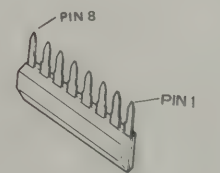


CX-7925B (Q2018,2024)

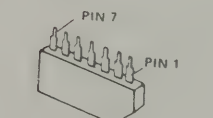
μPD4013BC (Q2014)



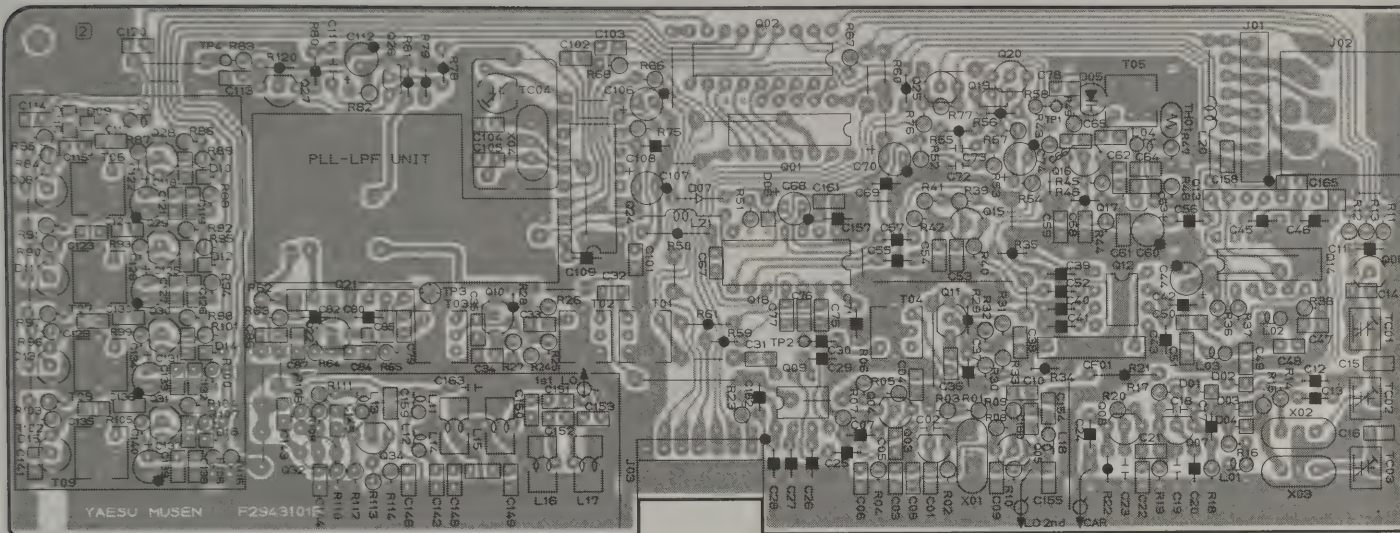
SN16913P (Q2009,2012)



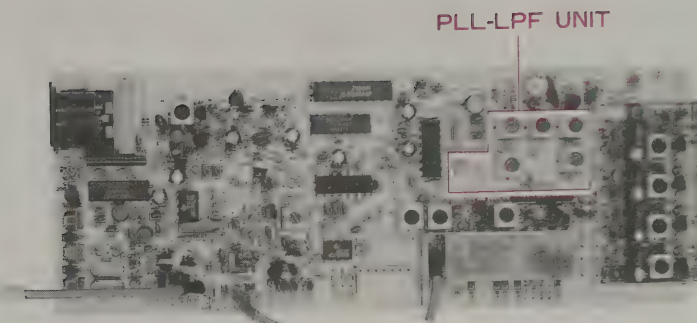
M54459L (Q2013)



μPC1037H (Q2021)

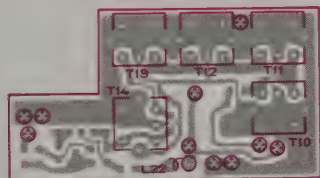


Component side (reverse)

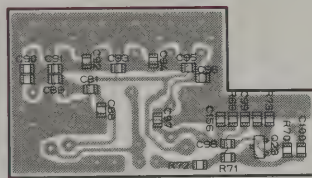


CIRCUIT DIAGRAM

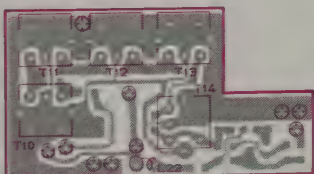
PLL-LPF UNIT PARTS LAYOUT



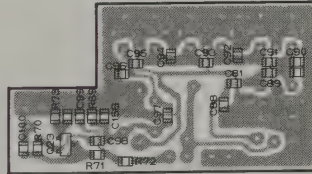
Component side (obverse)



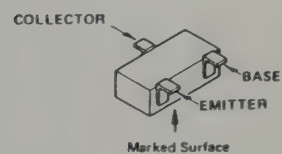
Solder side (obverse)



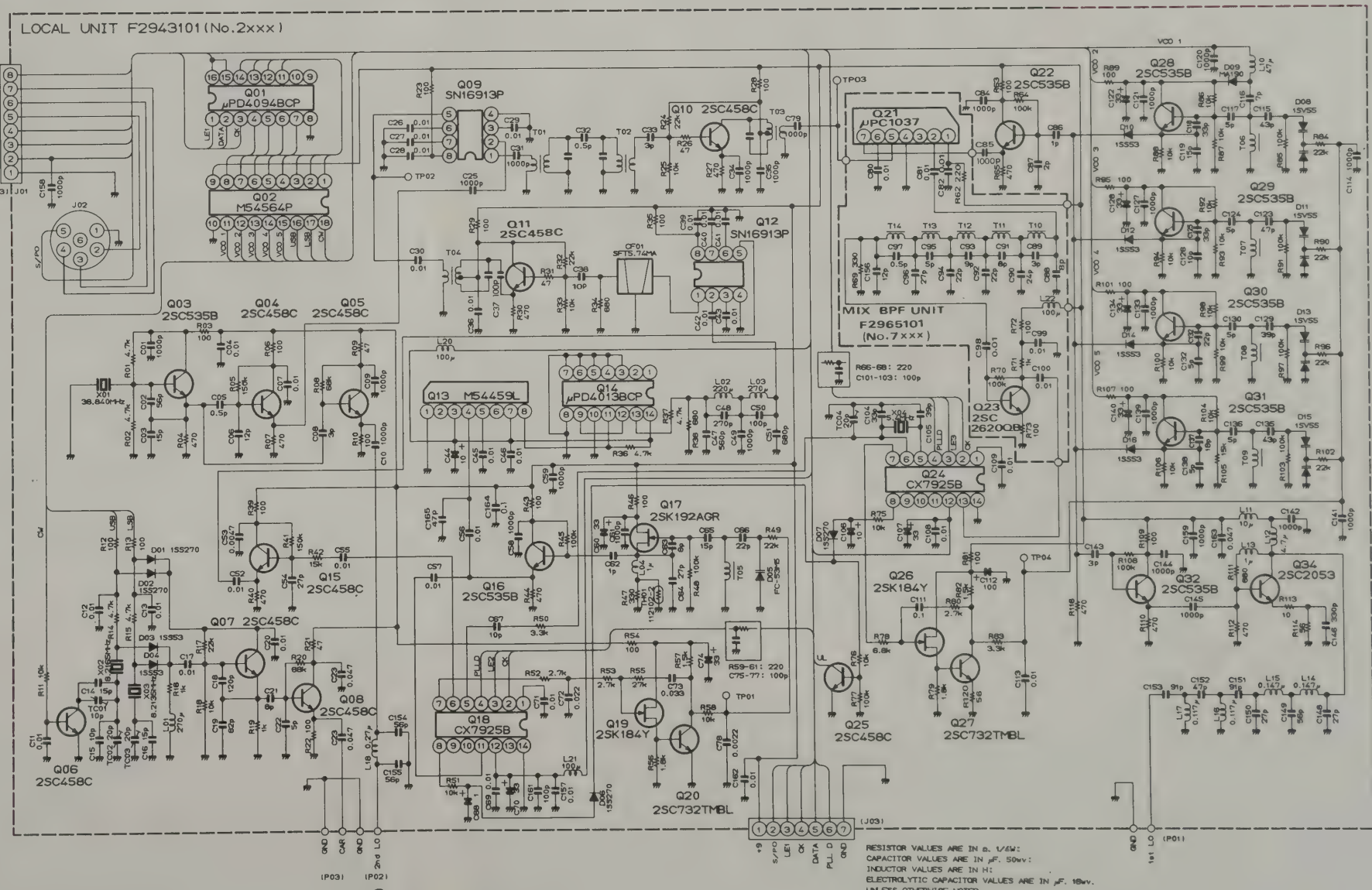
Component side (reverse)



Solder side (reverse)

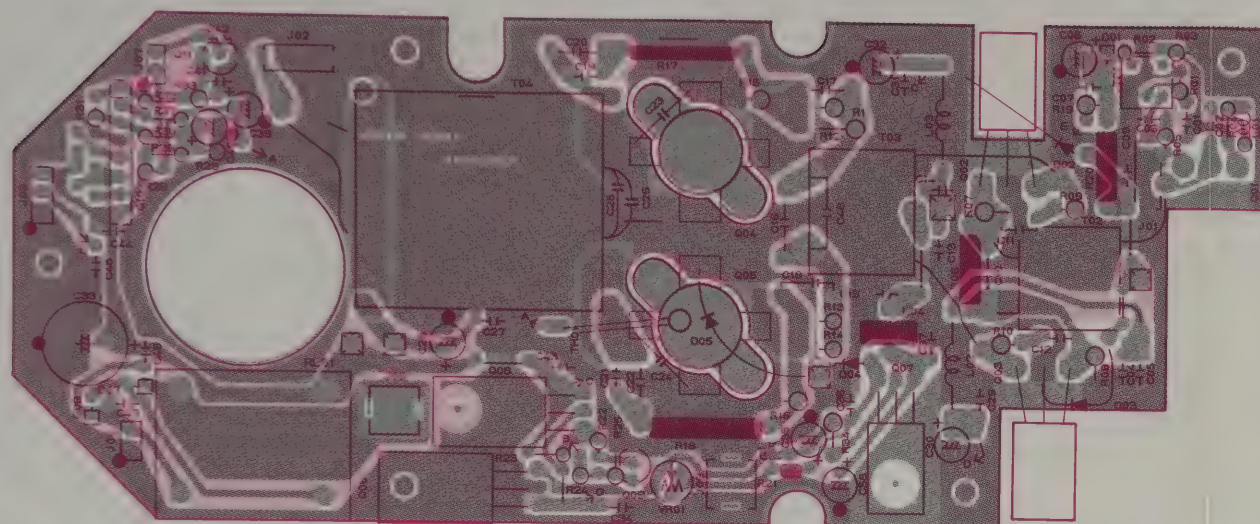


2SC2620QB (Q7023)

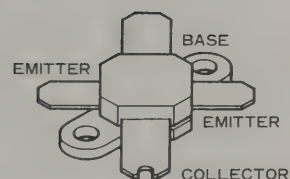


100W PA UNIT

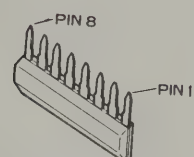
PARTS LAYOUT



Component side (obverse)



2SC3240 (Q5004,5005)



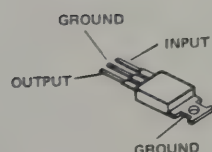
M5218L (Q5010)



2SB824R (Q5008)
2SC2166 (Q5001)



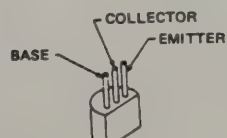
2SC3133 (Q5002,5003)



μPC7808H (Q5006)



2SD882Q (Q5007)



2SC458D (Q5009)
2SC2001 (Q5011)

PA UNIT VOLTAGE CHART

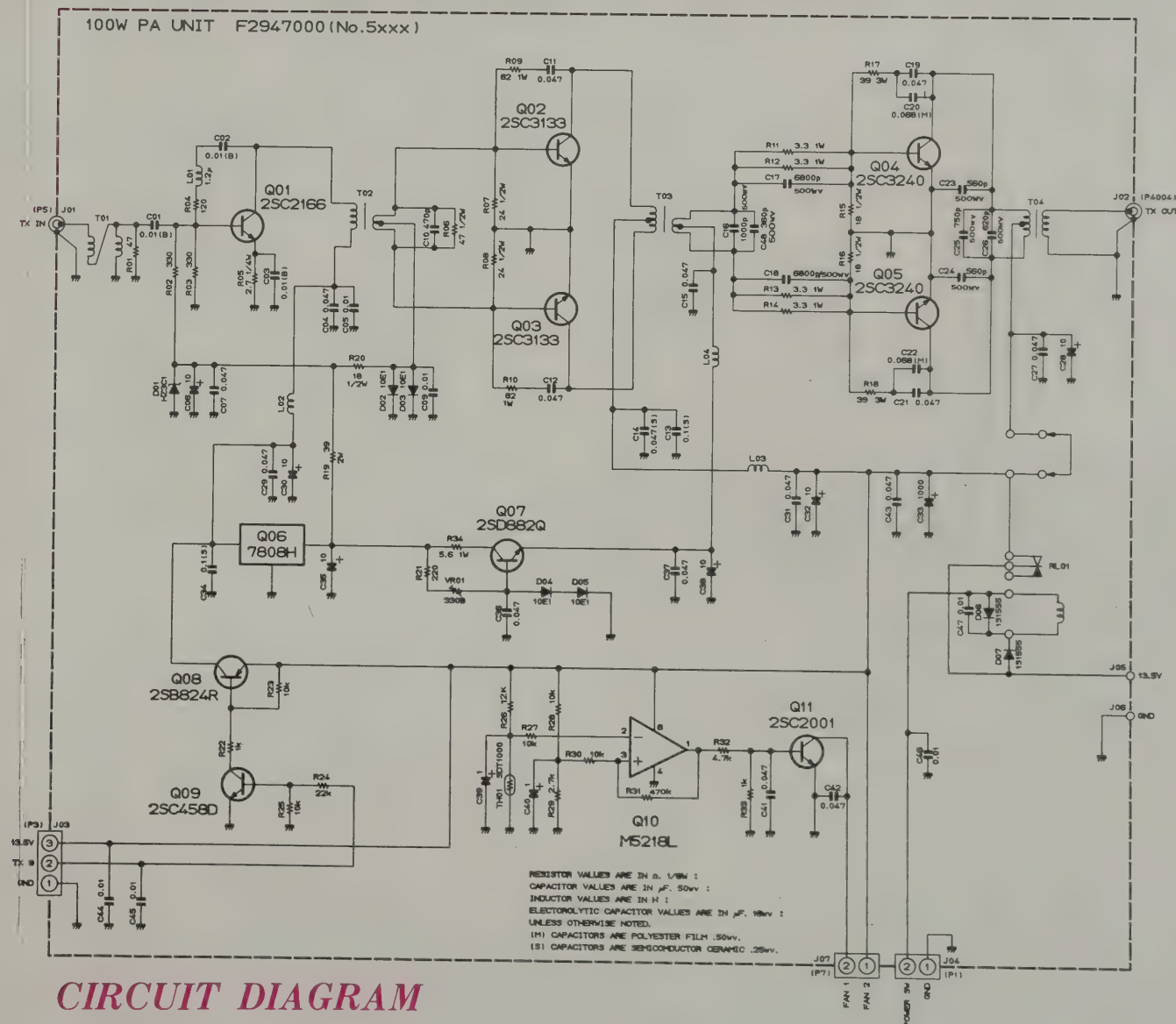
(DC VOLT)

	E	C	B	REMARKS
Q5001	0/0.4	0/13.4	0/1.2	RX/TX
Q5002	0/0	13.5/13.5	0/0.7	RX/TX
Q5003	0/0	13.5/13.5	0/0.7	RX/TX
Q5004	0/0	13.5/13.5	0/0.6	RX/TX
Q5005	0/0	13.5/13.5	0/0.6	RX/TX
Q5007	0.4/1.4	0/7.6	0/0.7	RX/TX
Q5008	13.5/13.5	0.5/13.4	13.5/12.7	RX/TX
Q5009	0/0	13.5/0.1	0/0.7	RX/TX
Q5010	0	13.5	0.2	

PA UNIT IC VOLTAGE CHART

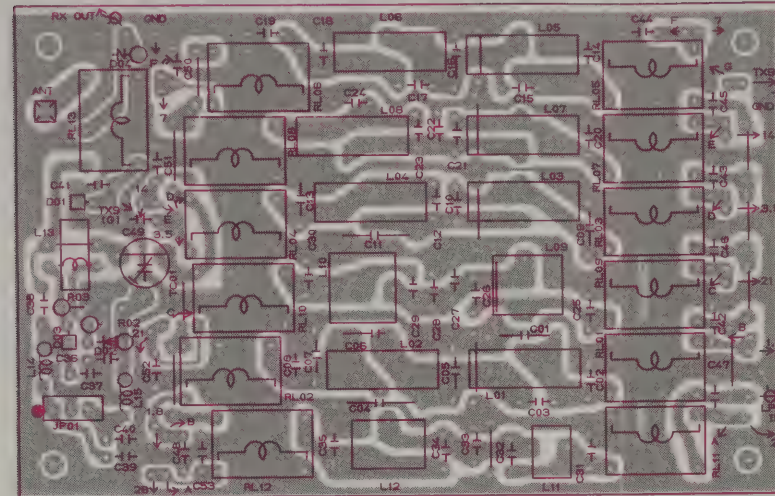
(DC VOLT)

	1 (IN)	2 (GND)	3 (OUT)	4	5	6	7	8	REMARKS
Q5006	0.4/13.4	0/0	0/8.0						RX/TX
Q5010	1.4/1.3	40-70/10-30	2.8/3.1	0/0	—	—	—	13.5/13.5	FAN OFF/ON

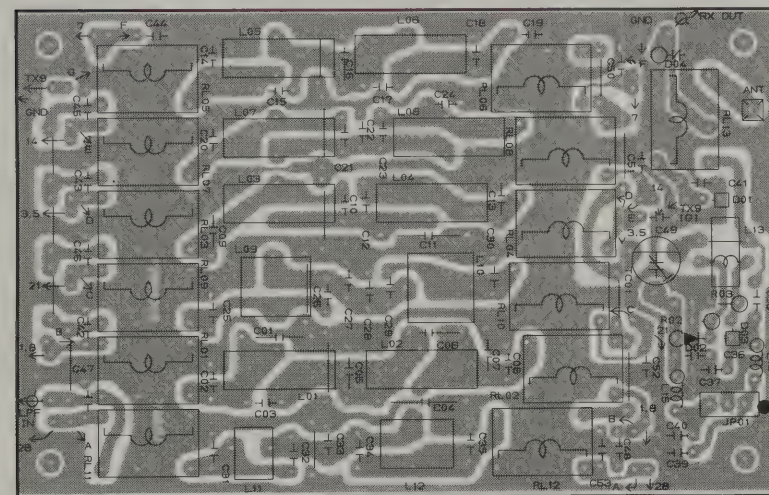


CIRCUIT DIAGRAM

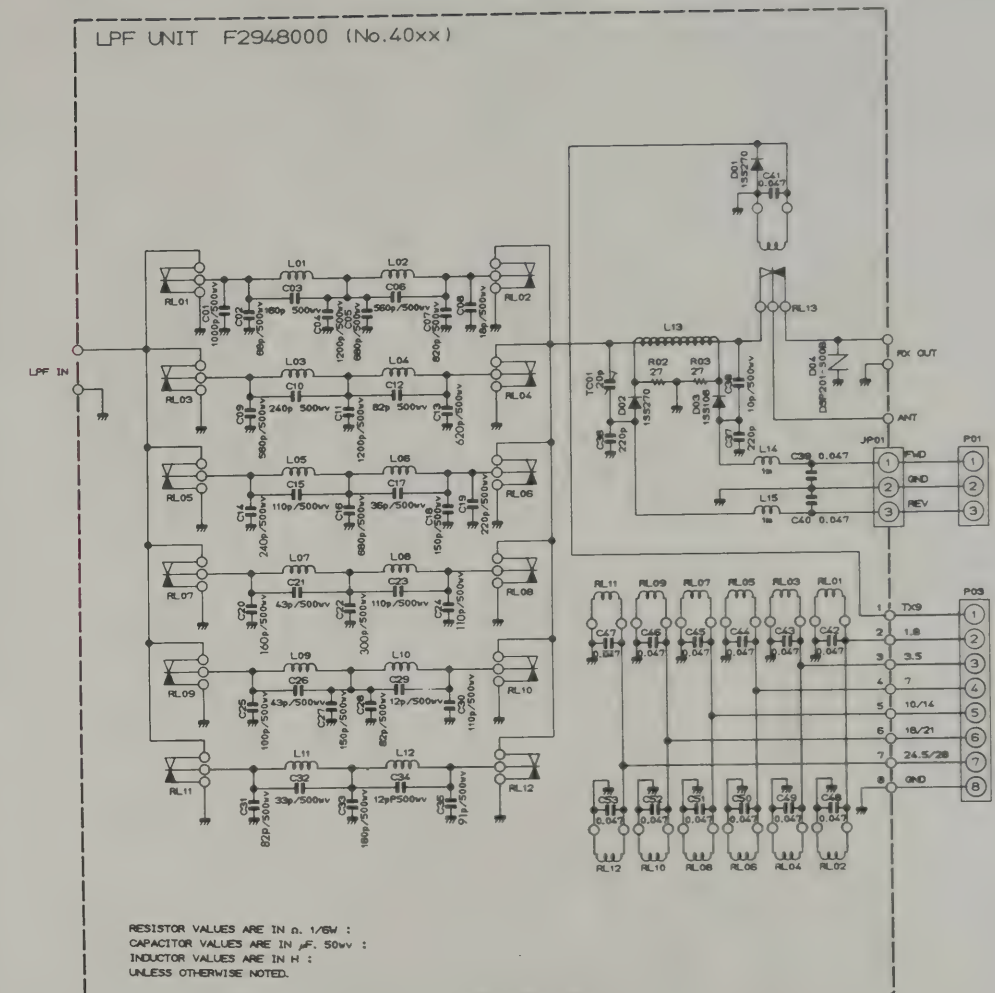
PARTS LAYOUT



Component side (obverse)



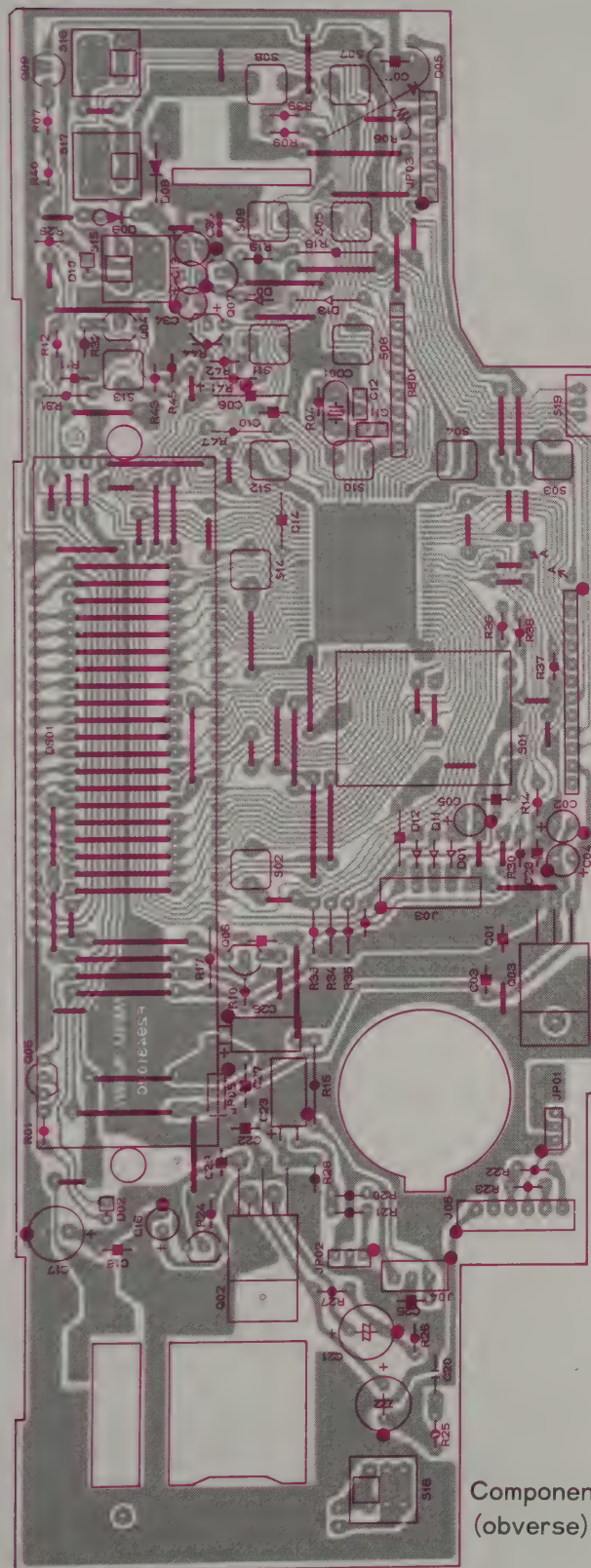
Component side (reverse)



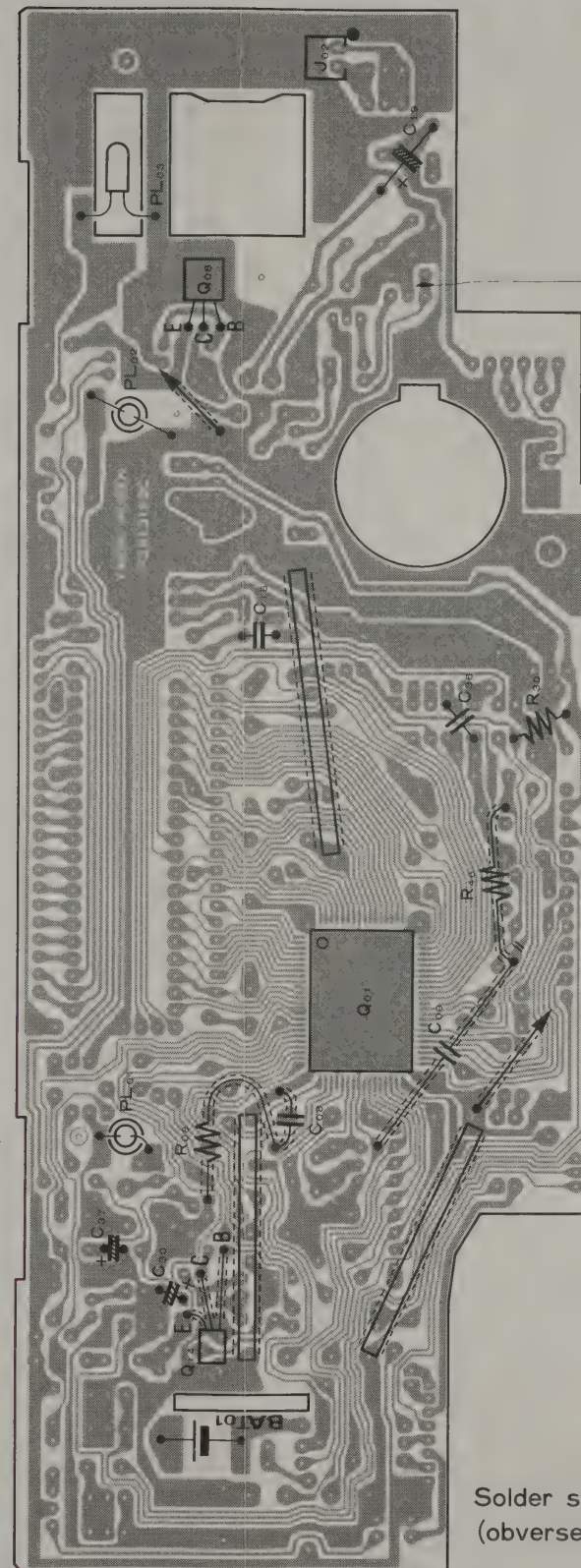
CIRCUIT DIAGRAM

DISPLAY UNIT

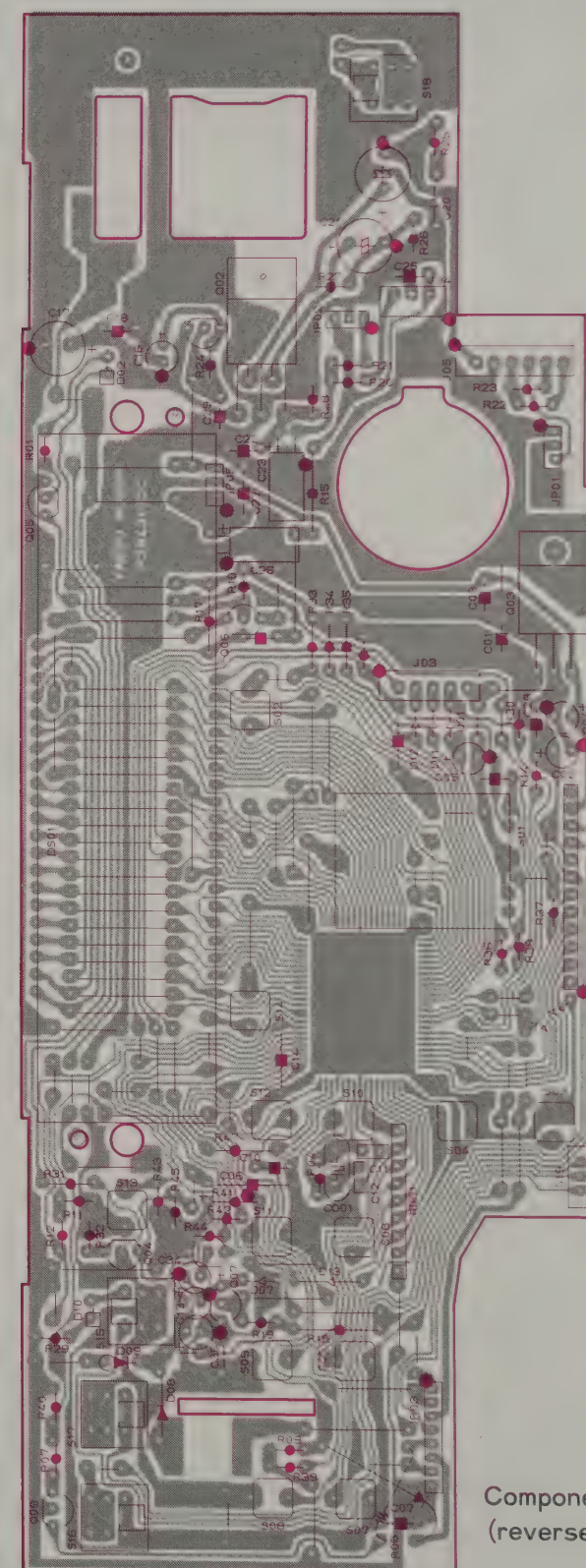
PARTS LAYOUT



Component side
(obverse)

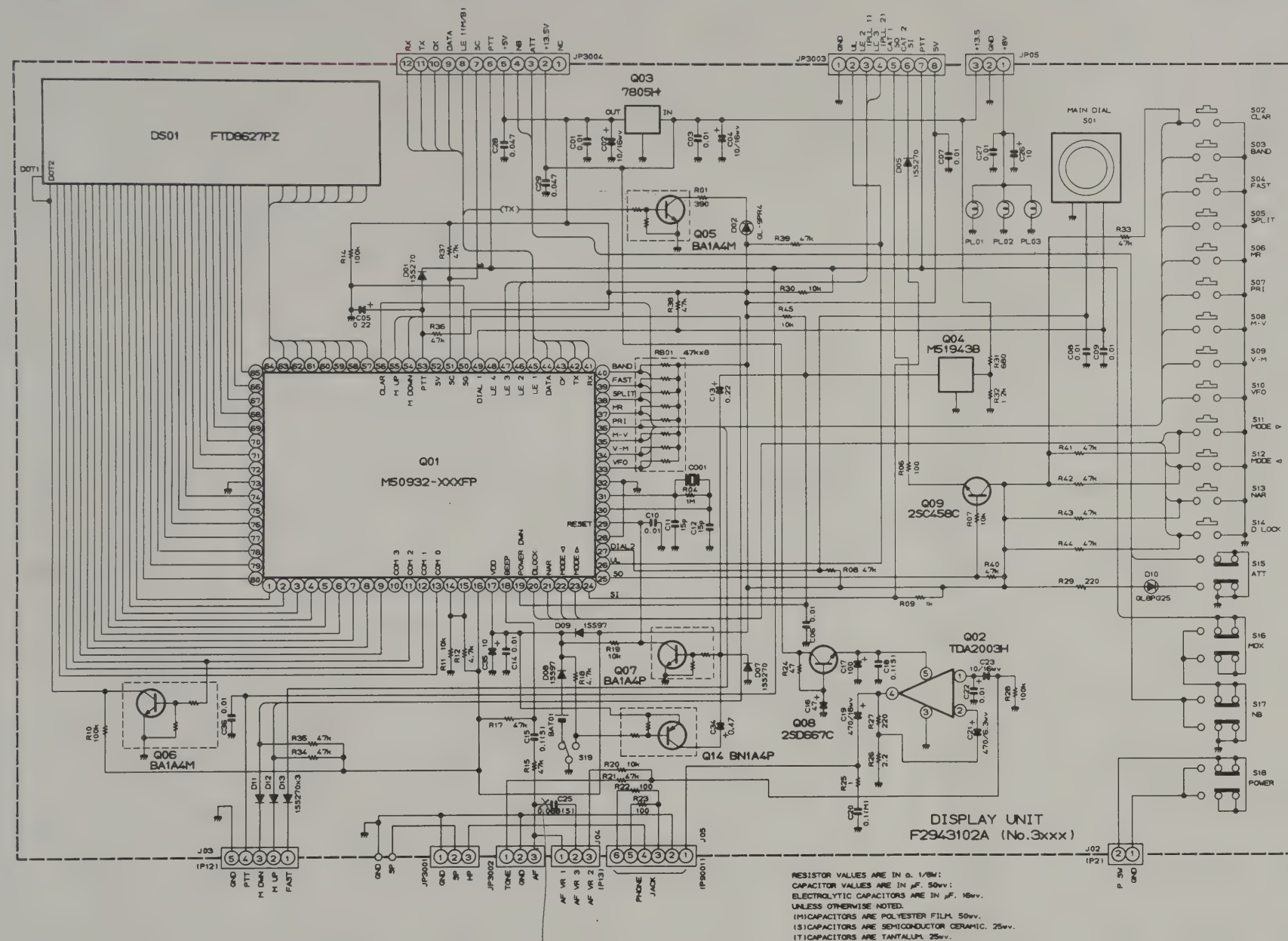


Solder side
(obverse)



Component side
(reverse)

CIRCUIT DIAGRAM

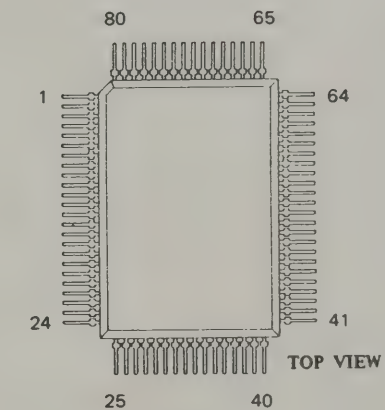


DISPLAY UNIT VOLTAGE CHART
(DC VOLT)

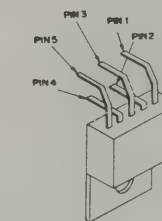
	E	C	B	REMARKS
Q3005	0/0	3.5/0	0/4.5	RX/TX
Q3006	2.7	0.8	0	
Q3007	0	4.6	0	
Q3008	12.7	13.4	13.4	
Q3009	4.2	5.0	4.6	
Q3014	4.6	0	4.0	

DISPLAY UNIT VOLTAGE CHART
(DC VOLT)

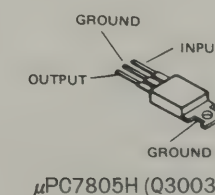
	1 (IN)	2 (GND)	3 (OUT)	4	5	REMARKS
Q3002	0.7	0.1	0	4.8	12.7	
Q3003	13.5	0	5.0			
Q3004	8.3	0	5.0			



M50932-501FP (Q3001)

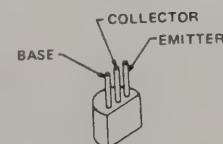


TDA2003H (Q3002)

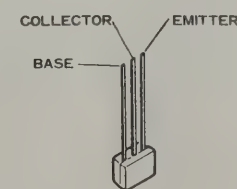


M51943BSL (Q3004)

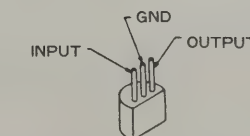
μ PC7805H (Q3003)



2SC458 (Q3009)
2SD667C (Q3008)

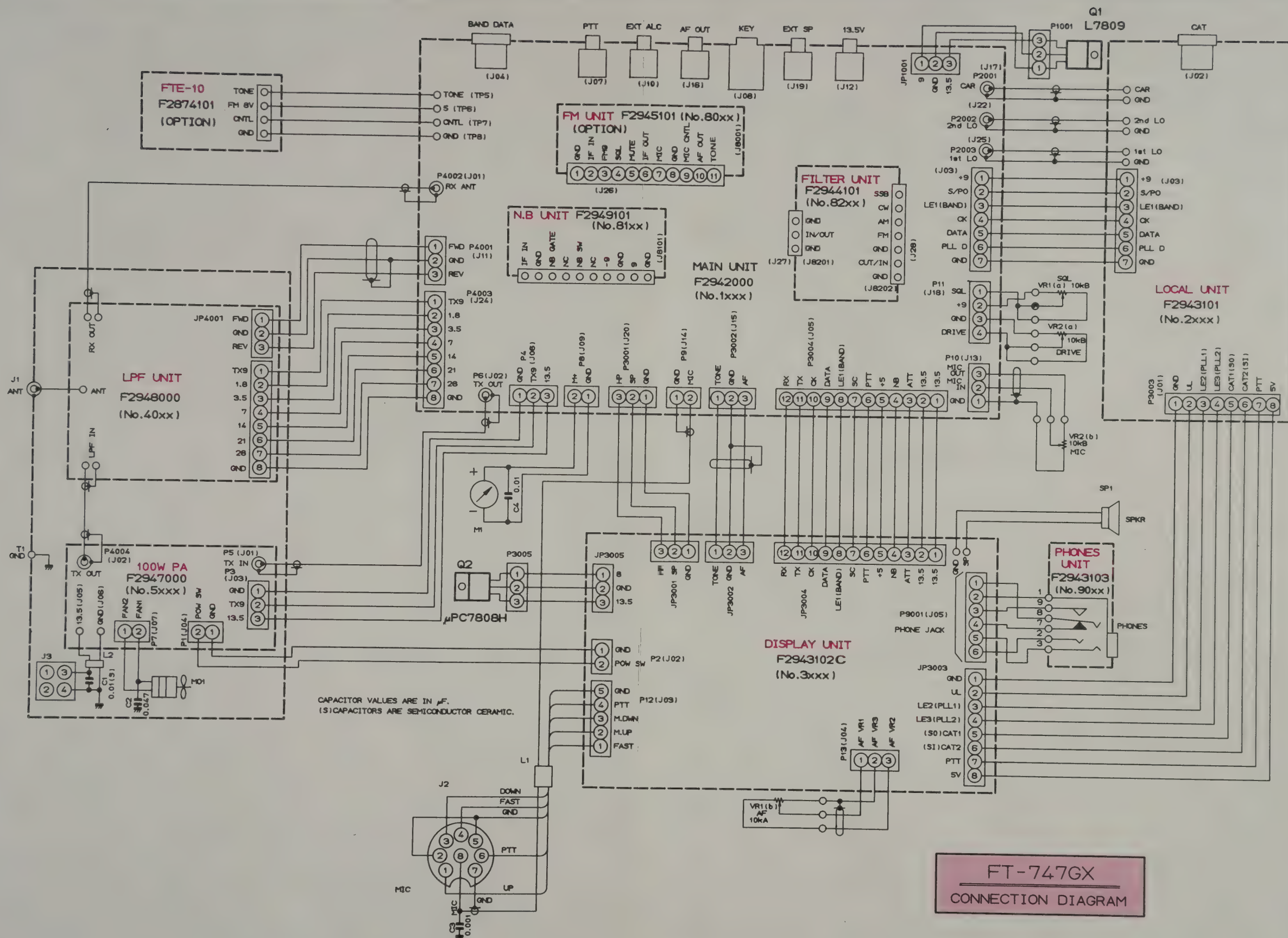


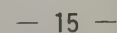
BA1A4M (Q3005,3006)
BA1A4P (Q3007)
BN1A4P (Q3014)



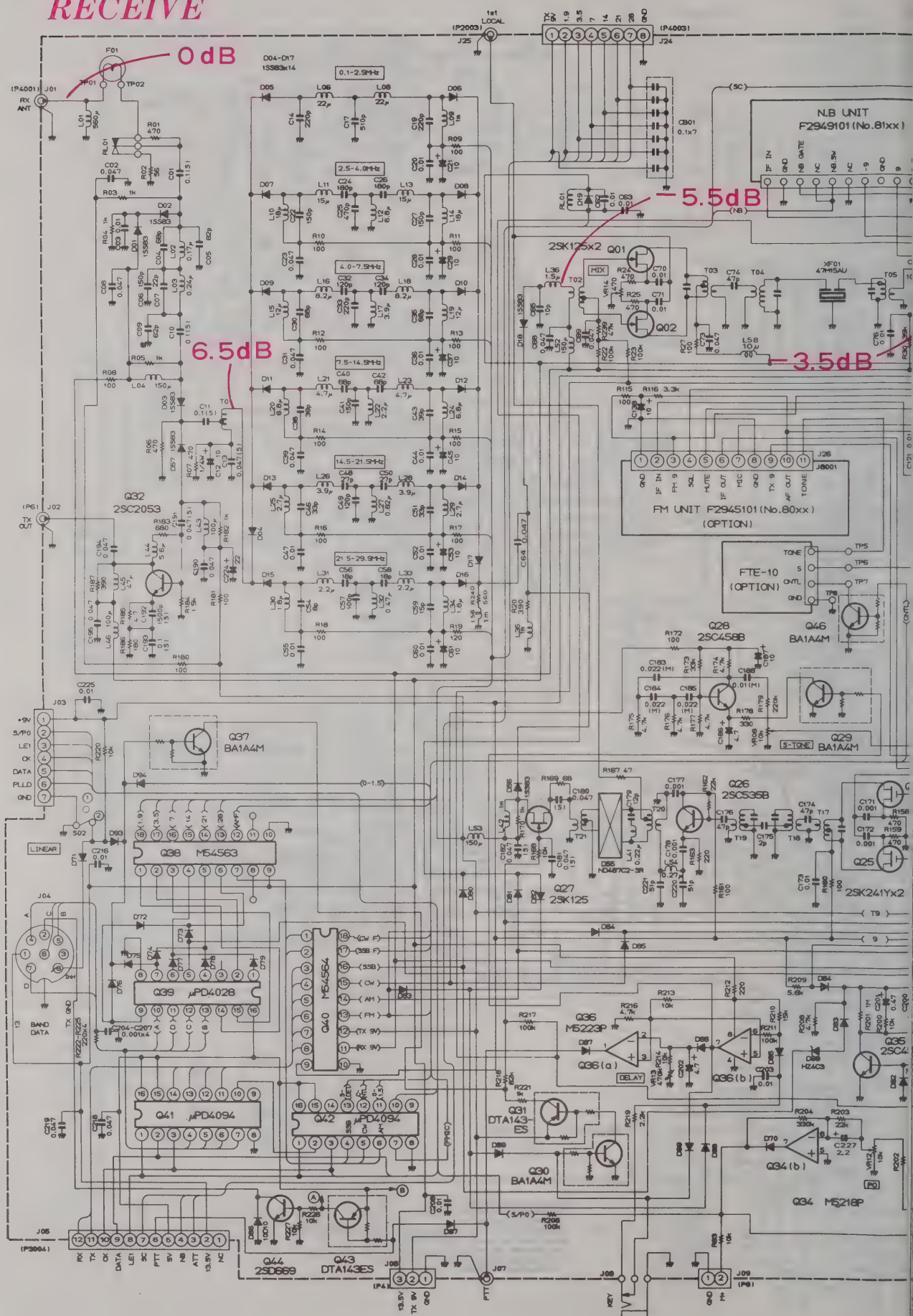
ATTN: See TB 8911 July 31, 1989

CONNECTION DIAGRAM





RECEIVED



TECHNICAL BULLETIN



YAESU

FILE NO: TB 8911
RELEASE DATE: July 31, 1989

Model No. FT-747GX

Problem or Symptom: Low Response to Receive-Audio Highs.

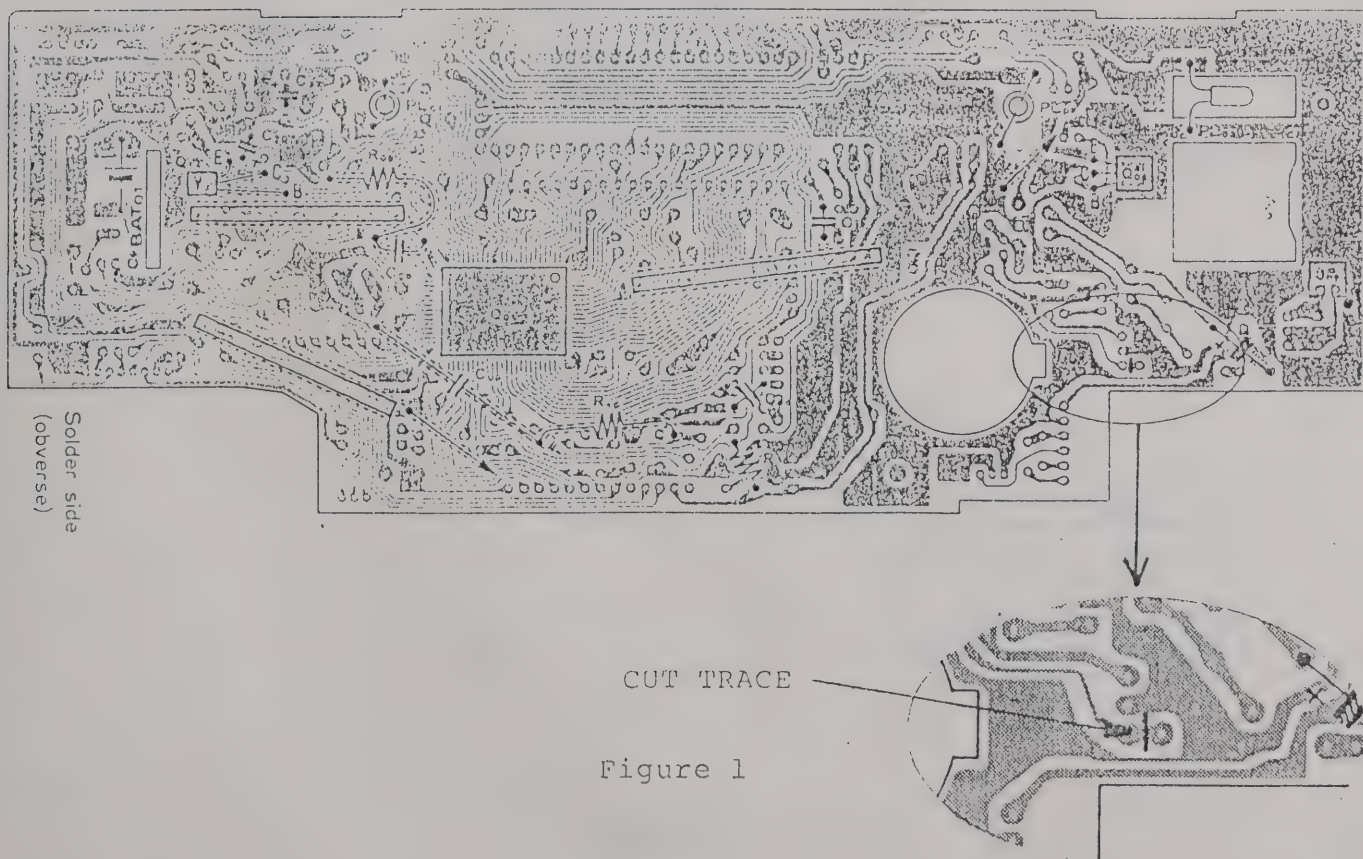
Expected Results of Modification: Expands Receive-Audio Passband to Approximately 3 KHz.

Component Changes: None

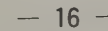
Component Addition: None

Component Deletion: Device Number-C3025
Location: Display Unit, F2943102

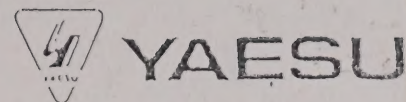
- Procedure:
1. Remove top cover as shown on page 23 of the Instructional Manual.
 2. Disconnect and lay the front panel down so that solder side of the Display Unit PB is accessible.
 3. Refer to Figure 1 for the location of the trace which must be cut. CAUTION - Make sure that only the one trace is cut, but also make sure that it is cut completely.
 4. Refer to Figure 2 for circuit change.



RECEIVED



TECHNICAL BULLETIN



FILE NO: TB 8911
RELEASE DATE: July 31, 1989

Model No. FT-747GX

Problem or Symptom: Low Response to Receive-Audio Highs.

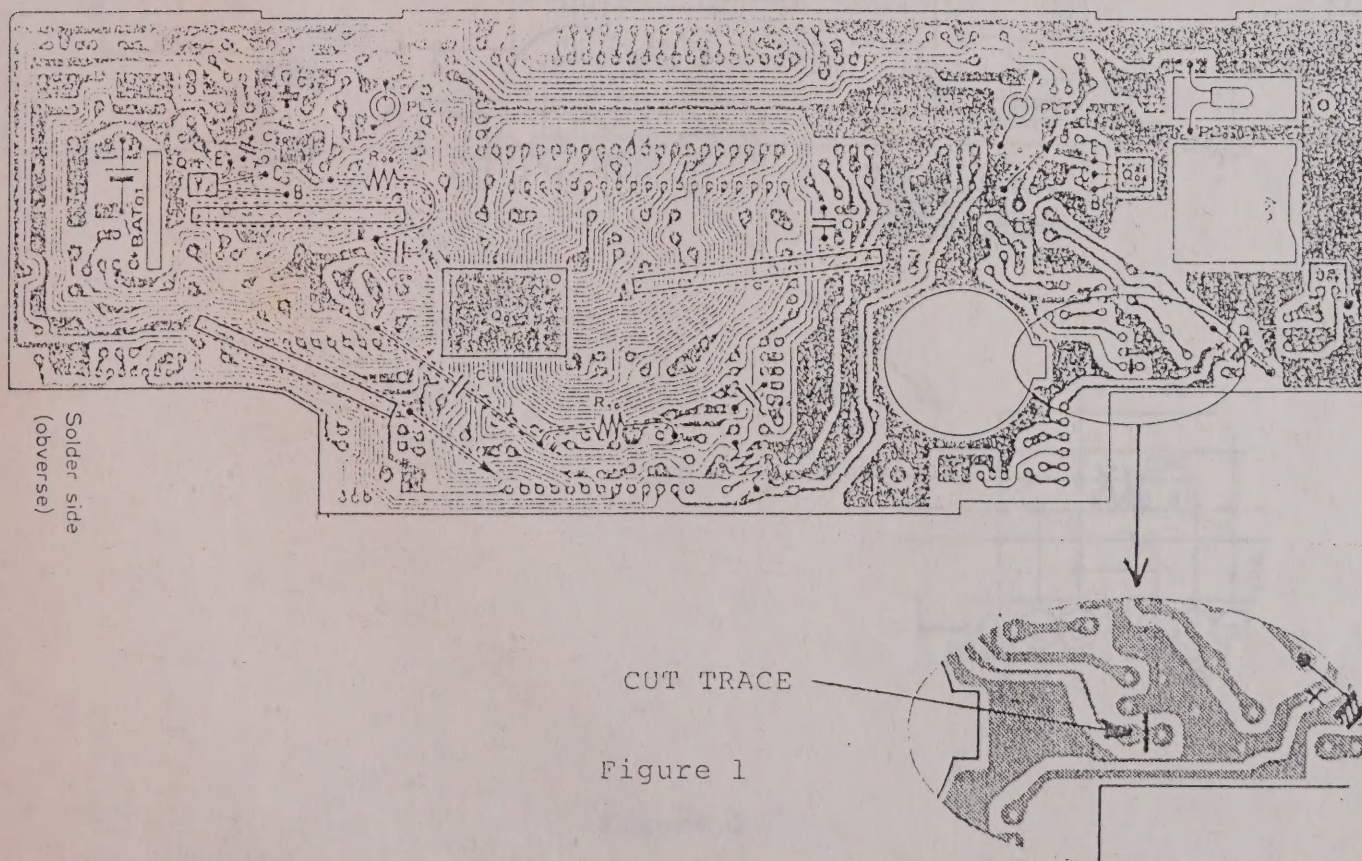
Expected Results of Modification: Expands Receive-Audio Passband to Approximately 3 KHz.

Component Changes: None

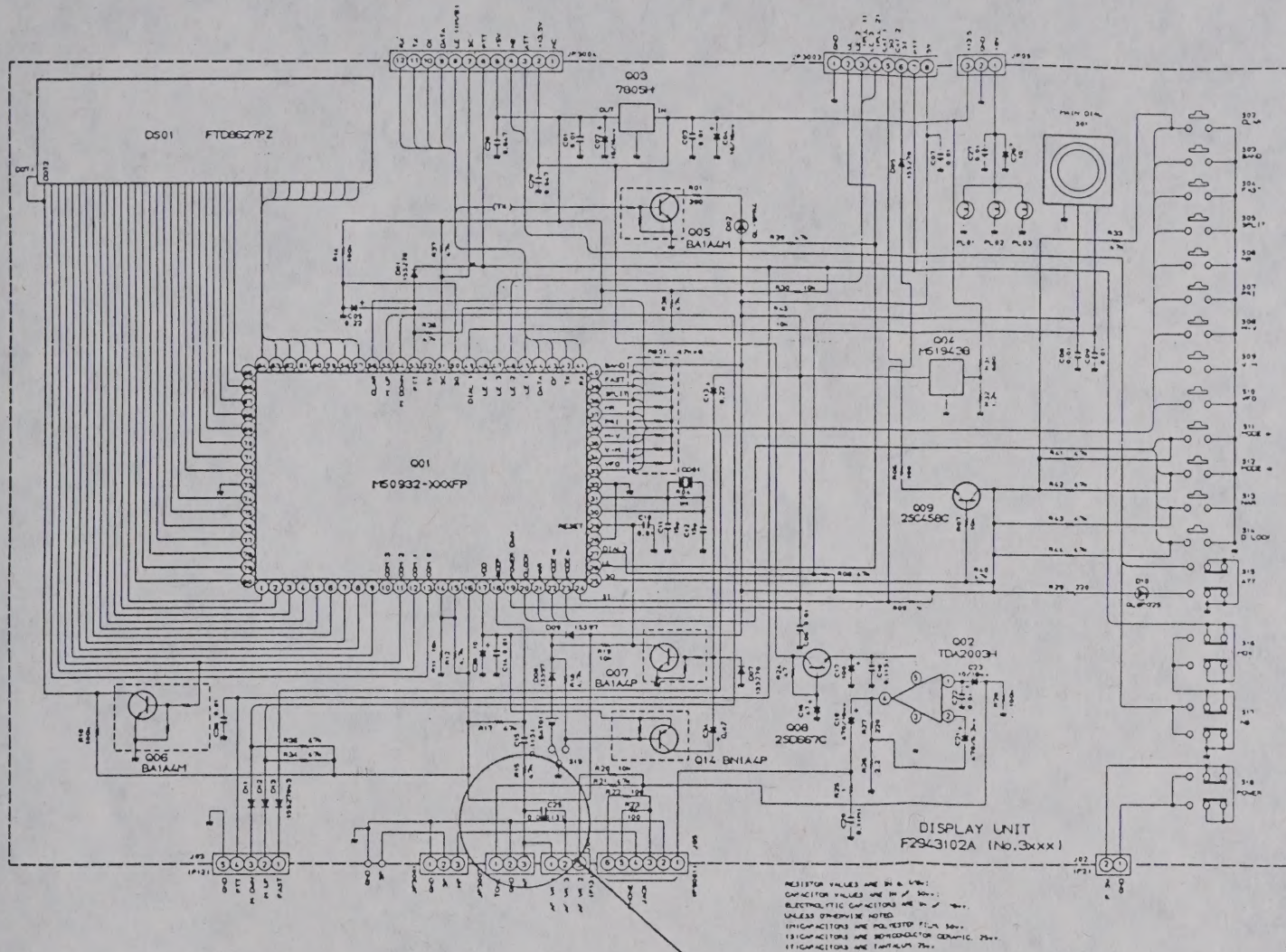
Component Addition: None

Component Deletion: Device Number-C3025
Location: Display Unit, F2943102

- Procedure:
1. Remove top cover as shown on page 23 of the Instructional Manual.
 2. Disconnect and lay the front panel down so that solder side of the Display Unit PB is accessible.
 3. Refer to Figure 1 for the location of the trace which must be cut. CAUTION - Make sure that only the one trace is cut, but also make sure that it is cut completely.
 4. Refer to Figure 2 for circuit change.



CIRCUIT DIAGRAM



CUT

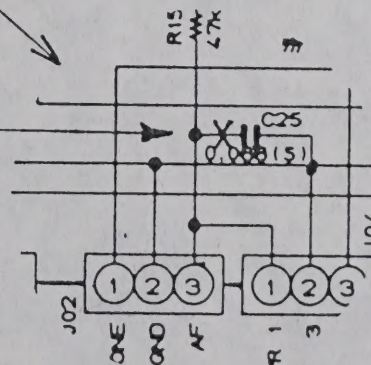


Figure 2

